RUBY LAKE NWR
NARRATIVE REPORT - 1967

RUBY LAKE NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

FOR 1967

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

RUBY VALLEY, NEVADA

REFUGE PERSONNEL

Donald E. Lewis	Refuge Manager
Omer E. Larochelle (Transferred to Modoc Refuge 01/30/67)	Asst. Refuge Manager
James A. Creasy (Arrived on duty 01/30/67)	Asst. Refuge Manager
Gerald H. Morrow	Maintenanceman II
Virginia M. Lewis	Clerk (Typing)

Summer Temporary

Michael R. Green	Laborer
Stephen R. Bastien	Laborer
Joseph M. Jarvis	Biological Technician

C O N T E N T S

I. GENERAL

A. Weather Conditions

In summary, 1967 was very nearly normal, with recorded precipitation 94% of average and no extreme temperature variations. The unusual conditions occurred during the dry winter months, only 54% of normal, and the extremely wet spring months, 190% over average. Some of the early spring moisture, received as rain at headquarters, accumulated as heavy, wet snow at higher elevations.

Miles of wind increased by 3,711 miles, distinguishing 1967 as a windy year.

Total precipitation for 1966 was 7.46 inches as compared to 12.14 inches in 1967.

The following chart depicts monthly comparisons:

PRECIPITATION

Month	Snowfall	This month	Normal	Max. Temp.	Min. Temp.	Evap.	Wind (miles)
Jan.	20.0"	1.11	1.03	54	-05		1522
Febr.	2.0"	.11	1.06	59	02		1350
March	17.0"	.83	1.61	64	09		2076
April	7.0"	1.15	1.15	59	11		1908
May		2.33	1.14	86	23		1572
June		2.85	1.06	89	30	3.31	1169
July		.48	.53	94	46	9.30	1060
Aug.		.27	.49	94	45	9.19	1064
Sept.		.83	.72	89	33	5.46	1036
Oct.		1.13	1.20	79	19	3.59	1506
Nov.	5.0"	.74	1.40	66	09		992
Dec.	7.0"	.31	1.58	50	-12		1822
TOTAL	58.0"	12.14	12.97	94	-12	30.85	17,077

The Desert Research Institute has been salting the clouds west of the Ruby Range with an iodide solution. They have established recovery stations in the higher Rubies to note results.

B. Habitat Conditions

1. Water

Spring flows and water supplies held fairly constant throughout the year. Less water was required to maintain diked units at optimum levels allowing the South Sump to survive the evaporation period in better condition than usual. Water levels in the South Sump dropped only 13 inches, as compared to a 24 inch decline in 1966. Sufficient amounts of water entered the collection ditch and it was not difficult to maintain diked unit levels. Good water conditions remained for waterfowl brood rearing and the preservation of fish life. No changes were noted in growths of emergent and aquatic vegetation.

Accumulations of snow are about one-half of normal, thus far predicting a poor water supply for 1968. Late spring storms are needed to alleviate the situation.

SNOW COURSE READINGS

Course	Elev.	Date	Snow Depth	Water Content Inches	Water Content Last Year	Water Content Normal
Cave Creek	7500	2/27	35.9	12.0	16.7	13.1
Hager Canyon	8000	2/27	46.2	16.5	16.4	17.1
Cave Creek	7500	3/28	22.0	8.6	10.1	14.1
Hager Canyon	8000	3/28	33.5	14.9	11.5	20.4

Water content and snow depths decreased during March to 68% below average, but conditions reversed in April and May.

2. Food and Cover

Abundant marsh and aquatic food plants more than supplied waterfowl requirements. Favorite feeding locations were extensive areas of pondweeds, water milfoil and coontail. Divers used fringed portions of dense stands of emergent vegetation for nesting and all birds used these stands for protection. Dense hardstem growths remained unchanged.

Upland vegetation received large amounts of moisture during April, May and June and responded accordingly, producing enough forage for moderate grazing, as well as improvement in general range conditions. Irrigated refuge hay meadows produced an extra heavy hay crop. Mowing was delayed until September allowing all waterfowl nesting to reach completion. After mowing, the fields became very attractive to geese. The refuge breeding stock of Canada geese arrived early before the marsh opened, and utilized the 85 acres of refuge planted common rye and supplemented this green grouse with crested wheat and cheat grass below headquarters. The common rye fields were lightly disced in September for reseeding purposes.

II. WILDLIFE

A. Migratory Birds

Total annual waterfowl use increased in 1967 from 5,925,668 to 6,764,478 use days, up approximately 12%. (See following graphs.) This increase resulted from two factors: (1) migrant waterfowl remained for a longer duration due to a late freeze-up (2) an increased number of migrant coots. The cold snap and freeze-up in early November moved most of the birds toward their winter quarters.

Cinnamon teal, mallard, redhead, canvasback, gadwall, pintail and green-winged teal, in this order of importance, accounted for the bulk of duck use with American widgeon, lesser scaup, ruddy, shoveler and ringneck contributing most of the remainder. Cinnamon teal increased from 179,550 to 619,780 use days. The numbers of this bird simply showed a marked increase throughout the entire year.

The following chart summarizes duck use for 1967:

DUCK USE

Species	1967
Mallard	378,175
Gadwall	317,975
American Widgeon	155,750
Pintail	309,330
Green-winged Teal	213,990
Blue-winged Teal	15,400
Cinnamon Teal	619,780
Shoveler	61,390
Wood Duck	2,100
Redhead	237,370
Ringneck	55,615
Canvasback	232,190
Lesser Scaup	86,275
Common Goldeneye and Barrow's Goldeneye	9,135
Bufflehead	34,125
Ruddy	66,500
Common Merganser	1,785
Red-breasted Merganser	665
Hooded Merganser	420
TOTAL	2,797,970

Trumpeter swans were serious about nesting until a cold snap and light snow fall discouraged their attempts. Two pair renested; one in Unit 14, the other in the South Sump area. One cygnet was produced from each late nest. The nest in Unit 14 contained 4 eggs; one hatched on or about July 13, one egg was destroyed and two now reside in the Nevada State Museum in Carson City. The South Sump cygnet was not noted until late fall. Cygnet size indicated that it too was a late hatch. The Christmas waterfowl count revealed 22 adult trumpeters and two cygnets. A summary of the trumpeter swan since transplantation from Red Rock Lakes Refuge is in order:

> "Transplantation of a total of 85 trumpeters (non-breeders and cygnets) from Red Rock Lakes in Montana has occurred since 1957. Forty-four cygnets have been raised to flight age. However, the total refuge population continues to fluctuate between 18 and 25 adult birds. Many of the early non-breeders and cygnets did not establish residence. It appears that the annual breeding population of trumpeters remains at or about 14 (7 pairs). Their success is revealed in the following chart:

Breeding Year	Cygnets to Flight Age
1958	6
1959	7
1960	3
1961	2
1962	0
1963	6
1964	0
1965	9
1966	9
1967	2
GRAND TOTAL	44

Each year some swan loss is noted, but I am certain we are not losing all the cygnets produced each year fatally. I cannot give a definite answer to what happens to the missing birds. There could be a number of answers to the situation - here are possibilities: 1. Dispersion of population: During the nesting season only 7 pairs (14 birds)are using the refuge. Other birds have moved out, I know not where at present. 2. Not returning to Ruby to winter: After spring and summer dispersion all the birds are not returning, possibly they have located other wintering areas. Steptoe, Goshute, Antelope, Independence, Huntington and Diamond Valleys all have similar habitat and have not been checked for swans. The Humboldt River is another large area. Some of these birds may be moving farther than we think; I personally don't overlook the Snake River. 3. Could it be possible that some of the trumpeters are migrating with the whistlers?

From the Lacreek Refuge Narrative Report there seems to be a similar set of circumstances without definite answers."

Whistling swans usually do not frequent Ruby in large numbers. On December 7 and again on December 11, night migrations of large flocks of these swans occurred.

The refuge nesting flock of Canada geese, about 250, arrived in March congregating in the large spring on the collection ditch below headquarters until the marsh became free of ice. The pairs then dispersed to their respective nesting areas. Production can be noted in the chart at the end of this section.

Coots responded to good water conditions and produced an average crop. Large numbers were censused shortly before freeze-up, peaking at 28,000.

Waterfowl production figures for 1967 are summarized below:

WATERFOWL PRODUCTION - 1967

Species	Production	
Mallard	950	
Gadwall	480	
American Widgeon	50	
Pintail	75	
Blue-winged Teal	50	
Cinnamon Teal	1,250	
Shoveler	150	
Redhead	1,000	
Ring-necked	180	
Canvasback	750	
Lesser Scaup	450	
Ruddy	225	
DUCKS TOTAL	5,610	
SWANS TOTAL	2	(One cygnet discOvered late in the fall.)
GEESE TOTAL	280	
COOTS TOTAL	6,500	
GRAND TOTAL	12,392	

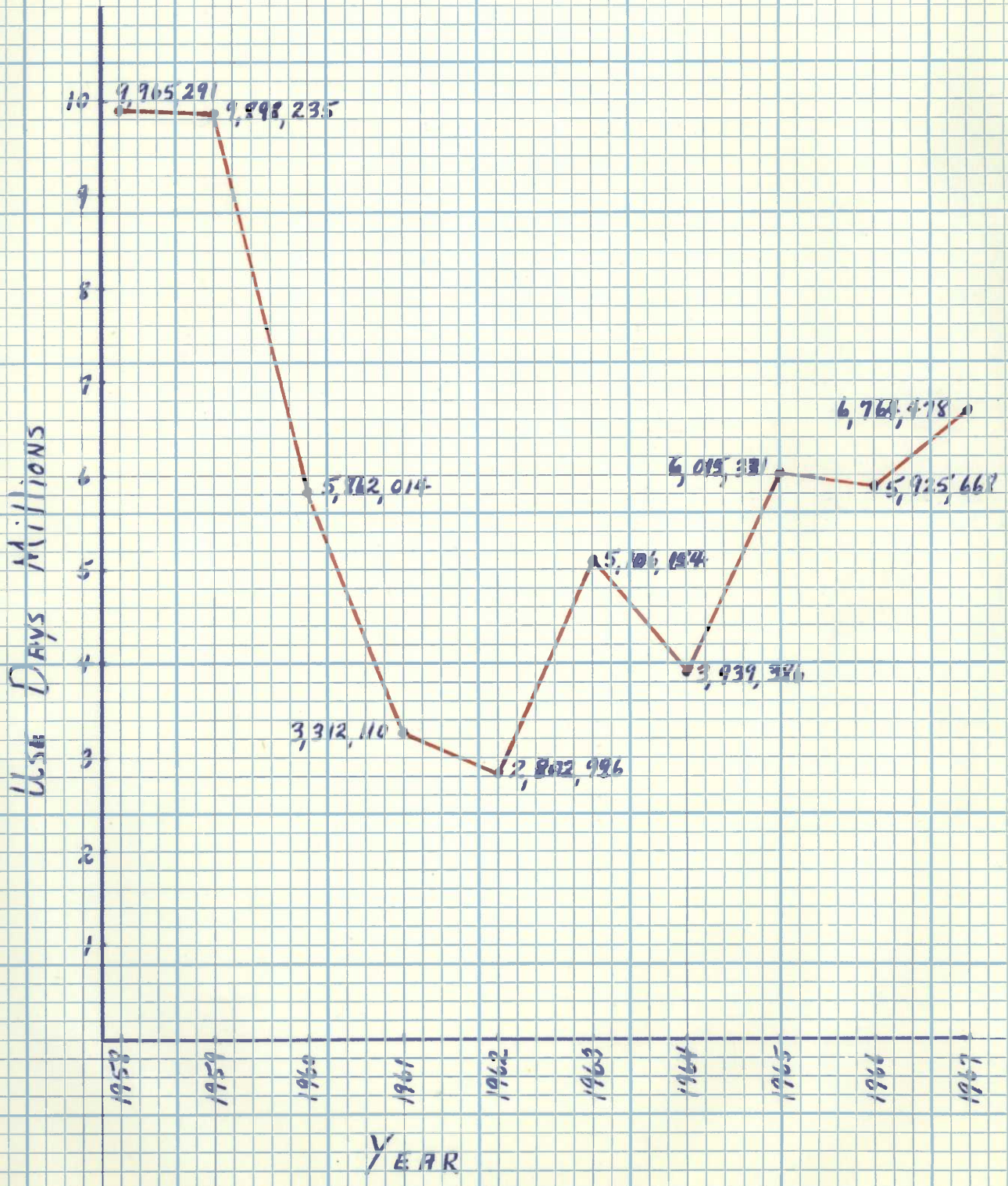
Brood sizes were recorded throughout the summer and averaged. Results were:

Species	Brood Size
American Widgeon	5.2
Mallard	5.7
Cinnamon Teal	5.7
Ruddy	4.7
Lesser Scaup	8.6
Canvasback	6.6
Gadwall	6.4
Redhead	5.3
Shoveler	7.5
Canada Goose	4.2

The two graphs on the following pages compare total waterfowl days use for the past ten years and comparable five year use by species.

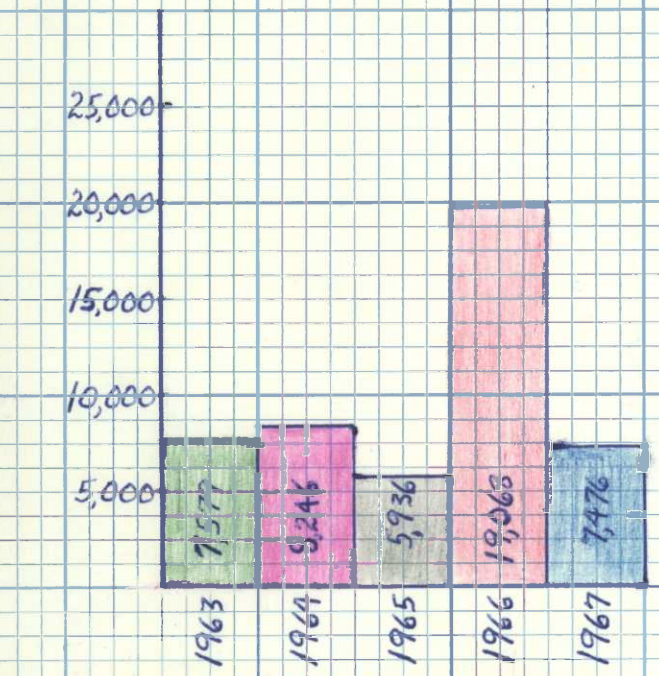
COMPARATIVE TEN-YEAR TOTAL WATERFOWL USE

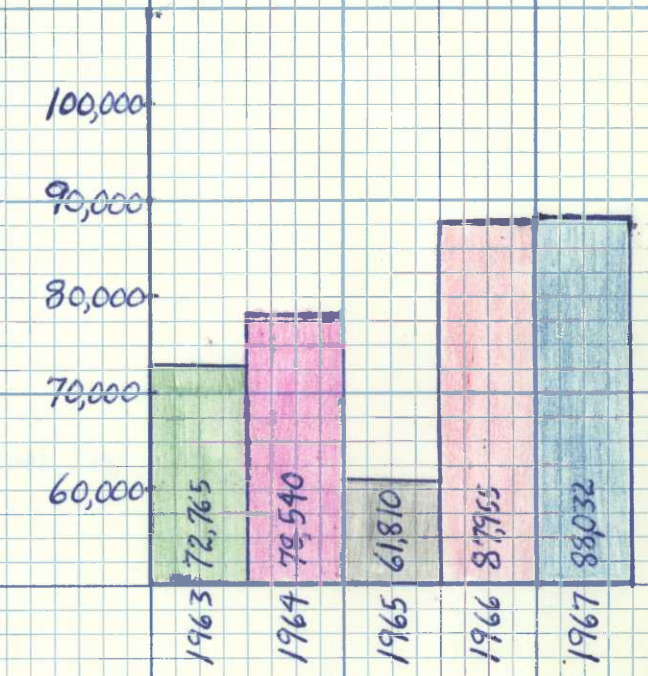
January 1 to January 1

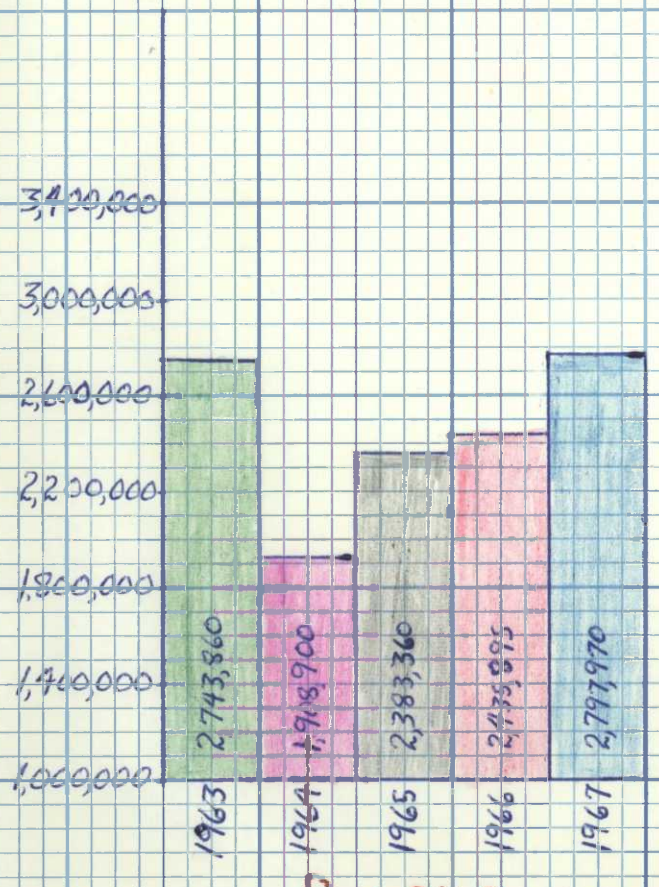


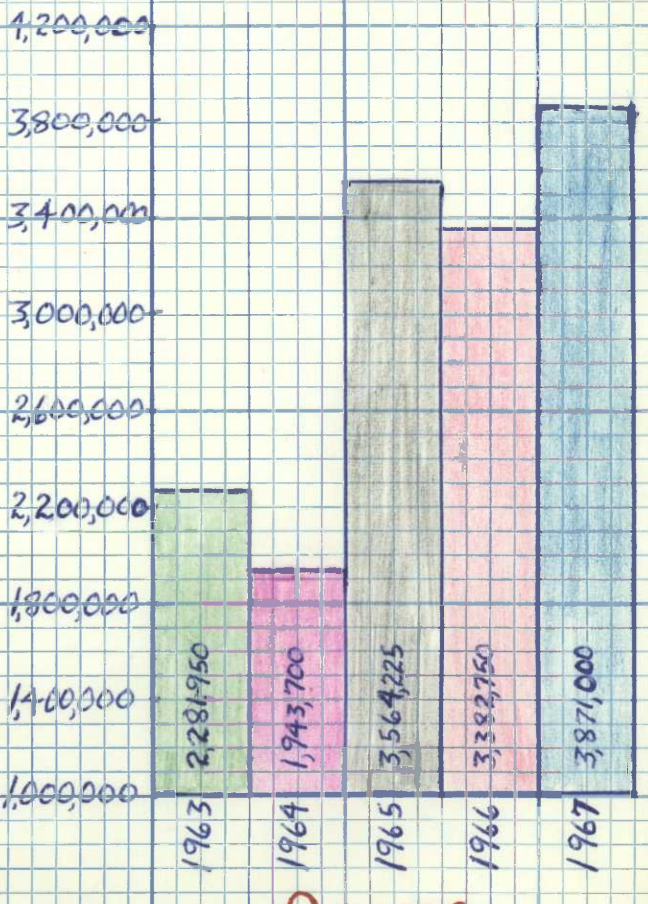
COMPARATIVE USAGE BY SWANS, GEESE, DUCKS AND COOTS

January 1 to January 1









B. Upland Game Birds

The refuge is inhabited by four upland game species - sage grouse, California valley quail, chukar and gray partridge. The sage grouse and the California valley quail found conditions to their liking and increased both in number and range respectively. Quail coveys have occupied at least two additional alluvial fans. The Ruby Mountains seem to be a natural barrier to the chukar. Good populations exist to the west, with only scarce inhabitations on the east. Gray partridge have probably occupied all suitable habitat in the valley; their population remains static.

C. Big Game

Approximately 1,000 mule deer used refuge lands during their spring and fall migrations. Four to six hundred deer could be seen on late afternoon drives along the western boundary during February and March. Large groups of 200 were counted. Custom prevailed again, several does had their fawns in the willow patches below headquarters.

Moderate to heavy hunting occurred along the southwestern refuge boundary. The Nevada State Big Game Season was set to range two weeks later than usual. Good numbers of deer were nearing their wintering areas before the end of the season. The mild winter, however, has not concentrated the herds and many animals are scattered along the eastern face of the Rubies. In late December, 63 deer could be seen from the Refuge Manager's breakfast table as they grazed above Cave Creek. Some are nightly visitors to the headquarters lawns.

D. Fur Animals, Predators, Rodents and Other Mammals

Two adult beaver moved to Cave Creek early in 1967 and established residence. The refuge itself is not good beaver habitat. They frequent the higher spring areas where the aspen-riparian type furnished better living.

The muskrat population was again used as a tool to control vast areas of hardstem bulrush with the opening effect beneficial to waterfowl. Approximately 15,000 to 20,000 muskrats inhabit the marsh. The annual harvest by three trappers for 1967 was 7,368 furs - 2,500 trapped in and in the near vicinity of the dikes to alleviate damage.

Coyote and bobcat populations are at a moderate level. Both animals travel the frozen marsh visiting one muskrat house after another in hopes of obtaining an easy meal. The muskrat

houses, also, harbor winter mice populations. Some coyote-muskrat predation has been noted by the trappers. It was necessary to reduce the coyote numbers in the southern portion of the refuge where lands border sheep range. This was accomplished by Division of Wildlife Services plane after a good snow fall in the spring of 1967. No bobcat control was necessary. It is felt that these animals are the controls on jackrabbits, cottontails, pigmy rabbits and other small rodents. The rodent population remains at a fairly low level. A few mink are present - two were accidently caught by the muskrat trappers. Short-tailed and long-tailed weasel sign and observations were more frequent indicating good numbers. Several porcupine wandered into the headquarters area. Badgers are slowly increasing, their diggings were noted along the western boundary.

E. Hawks, Eagles, Owls, Crows, Ravens and Magpies

Two small groups of turkey vultures arrived on March 9 and 13. A few days later the entire party, about 80, were using their traditional roost in the aspens and rocks near the opening of Cave Creek. The vultures do their scavenging until some undetermined signal calls them southward, always in October.

Cooper's, red-tailed, rough-legged and marsh hawks are common during the winter months. All of the rough-legs depart, Cooper's and red-tailed are reduced in number, but the marsh stays about the same as warmer weather developes. Two bald eagles and four golden eagles were using the refuge in late December. The balds are not seen during the summer, but at least two pairs of golden's nest near the refuge. The Refuge Manager, in cooperation with Nevada State Fish and Game employees, is working on a complete census of nesting eagles in northeastern Nevada. This portion of the Great Basin appears to be one of the last, large strong-holds left in North America. One osprey was observed in December. Two duck hawks and one prairie falcon were rarely seen. Sparrow hawks used the entire refuge on their hunting sorties.

Practically every canyon along the eastern slopes of the Rubies has a pair of horned owls. Two of these birds were caught and banded during early spring. Their calls can be heard each evening along Cave Creek and in the trees at headquarters. Short-eared owls were noted on many occasions in the marshy areas. The little saw-whet owls are present, at least during the summer. Magpies and ravens, permanent residents, are seldom out of calling range. The crows are transient visitors in spring and fall. The larger willow patches, serving as temporary roosts, sometimes contain from 150 to 250 birds.

F. Other Birds

Forty-seven birds have been added to the Refuge Bird List since mist-netting operations were initiated three years ago. Some of these specimens are distributional records for northeastern Nevada, as well as firsts for the state. Richard C. Banks, Chief, Bird Section, U.S. National Museum, Washington, D.C., and the Refuge Manager have completed a paper signifying these records. All collected specimens were identified and retained at the U.S. Museum, Washington, D.C. (see mist-netting operations.)

It was definitely established that the starling does not move northward in concentrated groups. A small number nest in the area, and large flocks are noted throughout the fall. Greater sandhill cranes raised 25 young. Two hundred thirty greaters frequently fed near the road on a private ranch a few miles north of Franklin Lake. Some noteworthy arrival dates were:

BIRD ARRIVALS

Species	Date
Redwinged Blackbird	2/13/67
Robin	2/13/67
Mountain Bluebird	2/23/67
Starling	2/26/67
California Gull	3/03/67
Turkey Vulture	3/09/67 & 3/13/67
Greater Sandhill Crane	3/09/67
White-crowned Sparrow	3/14/67
Loggerhead Shrike	3/12/67
Yellow-headed Blackbird	3/30/67
Brewer's Blackbird	3/30/67
American Avocet	3/31/67
Mourning Dove	4/03/67
Long-billed Curlew	4/03/67
Sparrow Hawk	4/07/67
Black-crowned Night Heron	4/09/67
Brown-headed Cowbird	4/17/67

G. Fish

Fishermen use reached an all time high of 27,353 visits during 1967. Mr. Eugene C. Dyer, Burbank, California caught the largest fish, a 27 1/8 inch, 9 lb. rainbow. Visitors ranged far and wide: Fresno, Long Beach, Elk Grove, Sacramento, Los Angeles, San Francisco, Whittier and San Diego, California; Honolulu, Hawaii; St. Joseph, Missouri; Tulsa, Oklahoma; Indiana; New Mexico; Colorado; Washington; Kansas; Pennsylvania; Mississippi and Iowa.

Fishermen success is revealed in the numbers of fish taken and registered from a creel census conducted by Nevada Fish and Game technicians. When calculated to total visits, 50,100 fish left the refuge in the creel:

Species	No.
Largemouth bass	28,400
Rainbow trout	13,600
Brown trout	4,600
Brook trout	3,500
TOTAL	50,100

Under a cooperative agreement the Nevada Fish and Game required an additional 6,800 small bass for transplanting and stocking other waters in the state. These locations were all in western waters: Tracy Pond, Fernley Wildlife Management Area, Indian Lakes, Idlewild Park Ponds in Reno and five farm ponds.

Largemouth bass conditions were excellent in the South Sump. Boat fishermen were well pleased with the quality and quantity available.

Refuge waters are not suited for trout reproduction - very little occurs. This fishery is on a stocking program regulated to meet the fishing demand. The following chart summarizes the planting program:

TROUT PLANTED IN REFUGE WATERS 1967

	Rainbow			Brown		
	No.	Lbs.	Size	No.	Lbs.	Size
Spring & Summer	16,401	7,393	1.2 to 3.1/lb.			
Fall				1,566	1,713	.80 to .93/lb.
				7,750*	375	20.7/lb.
TOTAL	16,401	7,393		9,316	2,088	
GRAND TOTAL FISH	25,717	LBS.	9,481			

*Right Pelvic fin clip

At the request of Dr. Carl L. Hubbs, Scripps Institute of Oceanography, LaJolla, California, five small fish samples were collected in isolated refuge waters, mainly springheads. The five sample sites covered the Ruby Lake Basin. Dr. Hubbs and Dr. Robert Russ Miller, University of Michigan, Museum of Zoology, Ann Arbor, Michigan, have been working on the native

fishes of Nevada for many years. The specimens collected by the refuge crew were identified as two types of dace - the speckled and the relict. The speckled dace has many local forms throughout much of the western United States and is a transplanted form in Ruby Valley. The relict dace, heretofore undescribed and lacking a scientific name, seems to be a native. A copy of their findings will go in the refuge files when Dr. Hubbs and Dr. Miller finish their paper.

H. Reptiles

A small number of rattlesnakes were killed during refuge operations. Various small lizards, horned toads and several non-poisonous snakes were observed. The bull snake was by far the most numerous.

I. Disease

No disease out-breaks of any type were detected in the wildlife populations. Grazing permittees reported no trouble with the numerous livestock diseases.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. Spring-head Development Program.
Good progress during the year on the major sources of the refuge water supply. Sixty-eight springs have received treatment and proper water control measures to date. Past practices ditched each spring so that continual irrigation resulted on lower meadows. Meadow grasses are declining and being replaced by less palatable, dense growths of, namely, wire grass. Each spring, or source of water, is desilted with the mobile dragline. Culvert water control structures are placed in positions so water flows can be directed toward the meadows, or the most direct route to the marsh. The spring-head survey of 1963 revealed 137 springs on refuge lands. Wintering waterfowl, especially the trumpeter swan, are making good use of these open water areas.

2. Interior Fencing.
The District Office of the Soil Conservation Service has furnished the refuge with a complete Soil and Range Survey. In order to properly manage these uplands, a deferred rotation grazing plan has been adopted. Approximately, 43 miles of interior fencing must be constructed to regulate cattle movements.

Suspension fence is being used in the flat expanses where 13.32 miles are complete at this writing. This 4-strand fence, with posts placed at 100 foot intervals, is constructed at approximately $200.00 less per mile than the regular fence. Fencing completed in 1966 - 8.16 miles, in 1967 - 5.16 miles.

3. Bulrush Plowing East Sump.
The 150 acres of hardstem plowed in 1966 was checked for effect. The undisturbed lanes contained three times as many plants as the plowed areas. The plants in the plowed portions did not mature and produce seed. The turned soil provides open water with natural cover readily available for protection and nesting.

Other maintenance projects either accomplished or in progress are as follows:

1. Water manipulation in all units.
2. Construction of two fence stiles - one at County Line Pond, the other below old CCC Camp.
3. Construction and placement of 28 "Dill" type goose nesting platforms and furnished new hay to 31 old platforms.
4. Completed two water skiing area signs.
5. Repaired and refinished 9 picnic tables.
6. Repaired sewer at Quarters #18.
7. Repairs of vehicles and heavy equipment.
8. Installed eave troughs - Quarters #17, 46 and shop.
9. Supervised trapping and sale of 7,368 muskrats.
10. Two trips to Cave Creek and Hager snow courses.
11. Repaired leak in Unit 14 dike.
12. Hauled and emptied 35 garbage cans weekly.
13. Replaced old office door.
14. Placed 5 speed limit signs on buoys in South Sump boating area.
15. Refinished kitchen cupboards - Quarters #17 and 46.
16. Collect, survey and sell excess property.
17. Refinished boat, constructed anchor and test seaworthyness.
18. Posting waters closed to fishing.
19. Fence repair, both interior and boundary.
20. Constructed 2 "Golden Eagle Passport" signs.
21. Repair of fire pumper.
22. Twelve miles of irrigation ditch was constructed and re-shaped to more economically disperse water needed for irrigation of meadows and other grasslands.
23. Two gradings on 12 miles of refuge road.
24. Graveled public parking area at Haystack Pond.
25. Beautification of headquarters lawn.
26. Refinished refuge signs along highway access routes.
27. Repair of culvert and road to Brown Dike.
28. Completed all stock watering tanks at windmills.

29. Constructed and seeded 100' X 100' exclosure in North Sump for reed canary grass study plot.
30. Periodically cleaned and repaired comfort stations.
31. Repaired and reshaped collection ditch dike below hatchery.
32. Construction of 2 small spring-head dams.
33. Graded fire breaks.
34. Weed cleanup with grader in school yard.
35. Lightly disced 85 acres of refuge grain.
36. Removal of 25 old hay stack yards.
37. Caulked and repaired porch - Quarters #17.
38. Replaced all cracked and damaged windows - headquarters.
39. Prepared Quarters #18, 2 garages and the barn for exterior painting.
40. Sprayed brush-beater and plows with rust preventive.
41. Completely painted interior of Quarters #46 and part of Quarters #17.
42. Completely braced garages at Quarters #46 and 18.
43. Attended Regional Training Conference, Portland.
44. Attended Bird Banding and Law Enforcement Workshop, Klammath Falls and Tule Lake.
45. Brood and breeding pair counts.
46. Trip to Kootenai Refuge for 5 ton of surplus grain.
47. Controlled burning of hardstem - East and North Sumps.
48. Replaced stop and waste valves in 3 fire hydrants.
49. Cut and gathered winter wood for shop stove.
50. Conducted regular fire drills and SAFETY meetings.

B. Plantings

1. Aquatic and Marsh Plantings

None.

2. Trees and Shrubs

None.

3. Upland Herbaceous Plantings

None.

4. Cultivated Crops

The 85 acres of common rye were disced, then lightly re-seeded in the thin areas. Fall discing, after moisture arrives, furnishes quanities of mature grain for waterfowl food and enough seed is turned under to produce next year's crop.

C. Collections and Receipts

1. Seeds and Other Propagules

Approximately 250 bushel, or five ton, of henchen barley was hauled from Kootenai Refuge by refuge vehicle for use as winter trumpeter swan feed and banding purposes.

2. Specimens

Two trumpeter swan eggs were collected after the nest was deserted. These eggs are in the Nevada State Museum in Carson City.

Sixty-two perching birds were collected during mist-netting operations for authentic distributional records. (See mist-netting operations for distributional records.) All the birds, except four specimens, are mounted in the U.S. National Museum, Washington, D.C. The four exceptions are on display in the Nevada State Museum, Carson City.

Five small fish samples, about 40 fish, were collected and sent to Dr. Carl L. Hubbs for scientific analysis and identification. (See further description II. Wildlife - D. Fish.)

D. Control of Vegetation

All refuge dikes and roadsides, as well as the headquarters, were mowed in order to keep these locations attractive and accessible.

2-4D Amine was sprayed on the ten miles of dike at 2 lbs. acid equivalent per acre. The spraying coincided with the bud stage of the Canada thistle for more effective control. No sage, rabbitbrush or greasewood received treatment.

E. Planned Burning

Portions of the North and East Sumps were burned to control dense growths of hardstem bulrush. When flooded, these burns create temporary openings that are readily utilized by feeding and brooding waterfowl. Some permanent openings were created by peat fires that have continued to burn in isolated locations since November 9. No burning of sage or rabbitbrush occurred.

F. Fires

No fires occurred on the refuge, however, the refuge crew aided the Bureau of Land Management on two brush fires adjacent to refuge lands.

IV. RESOURCE MANAGEMENT

A. Grazing

Seven active grazing permits were in effect in 1967: Orieal Saxton (23 horses, 187.83 AUM's); Walter Gardner (339 cattle, 1,118.03 AUM's); Duval Ranching Co. (684 cattle, 22 horses, 4,555.22 AUM's); Raymond Gardner (280 cattle, 20 horses, 1,183.80 AUM'S); Fort Ruby Ranch (79 cattle, 205.40 AUM's); Phillip Mariluch (2 horses, 12.50 AUM's) and James Creasy (3 horses, 16.33 AUM's). A total of 7,073.71 AUM's utilized at the rate of $1.50/cow and $2.00/ horse AUM, with a grand total of $11,173.40.

Range conditions were good to excellent on all refuge lands. The unusually wet spring produced good grass and brouse growths on Bureau of Land Management and Forest Service lands also, thus relieving pressure on refuge pastures.

B. Haying

The Duval Ranching Company annually irrigates and mows three wild hay meadows totaling 300 acres. They are allowed to stack a small amount of hay for emergencies, such as late spring storms; the remainder is bucked in piles. All hay is fed on the regular AUM basis.

C. Fur Harvest

The original recommended muskrat harvest for the 1966-67 season was set at 7,000 animals - 2,500 from the dike dens and adjacent feeders and 4,500 by a leap-frog method throughout the South Sump. Observations, both aerial and on the ground, have revealed that approximately 15,000 to 20,000 muskrats were using the marsh area. The trapper quotas were very satisfactorily reached with all well populated marsh portions covered. When trapping ceased, 7,368 muskrats were included in the harvest. The fur price dropped to a very disappointing $.70 average for both trapper and government shares. The refuge trapping is operated on the share basis with the government receiving 25% of the cured hides. The harvest of 7,000 muskrats annually is considered to be necessary to curb unusually high populations and still maintain good numbers to stem emergent vegetative growths.

The 1967-68 harvest is now in progress with 1,478 hides dried or on stretchers by December 31.

The chart below summarizes muskrat numbers and actual harvest by seasons:

MUSKRAT POPULATION AND HARVEST FIGURES

Season	Est. Population	Rec. Harvest	Actual Harvest
1962-63	10,000	3,000	3,179
1963-64	10,000	2,500	2,622
1964-65	10,000	3,000	3,292
1965-66	15,000	6,000	6,036
1966-67	15-20,000	7,000	7,368
1967-68	15-20,000	7,000	1,478 (12/31/67)

Furs for the 1966-67 season graded as follows:

FUR GRADING

Grade	Number	Percent
Large-xtra large	4,191	57
Medium slights	2,683	36
Slights	233	3
Damaged	261	4
	7,368	100

(See Muskrat Investigations V,C)

D. Timber Removal

None.

E. Commercial Fishing

None.

F. Other Uses

None.

V. FIELD INVESTIGATIONS OR APPLIED RESEARCH

A. Coot Investigations

One hundred forty-two American coot received bands during the 1967 pre-season waterfowl banding operations. Returns and recoveries continue to be low, interesting and varied. Outstanding recoveries for this year are mostly from the central, San Joaquin and Imperial Valleys in California, one each from Brigham City, Utah and Rosario, Sinaloa, Mexico.

B. Hydrologic Investigation

This research consisted of water sampling and measuring all the main springs on the refuge by the Desert Research Institute, University of Nevada. They are proceeding to determine the period of time required for the snow to percolate through the rock formations in the Rubies and emerge at the surface in spring flow. Water samples will be tested for trellium deposits. The higher percentage of trellium recorded, the faster the snow reaches the spring; the lower the percentage becomes signifies the longer time required for the snow melt to reach the sample site. The investigation will be continued through 1968.

C. Muskrat Investigations

During the 1966-67 trapping season 1,677 muskrats were aged by the pelt primness method and 824 fresh animals were aged, sexed, measured and weighed. Information on populations and their locations, plus animal conditions and trapping intensity was recorded. Trapping intensity and harvest over the entire marsh compared closely to the 1965-66 season. Traps sets per acre of marsh showed .42 and muskrats harvested per acre of marsh was .81.

Tables No. 1 and No. 2 depict some of the data being gathered:

TABLE NO. 1

TRAPPING PRESSURE AND HARVEST
ON SAMPLE UNITS 1966-67

Unit	Acres	Tunnels & Houses No. Trap Sets	Catch
9	5	0	0
10	240	152	428
12	5	5	14
13	160	226	362
14	360	337	753
15		4	13
16	10	10	5
17		31	33
18		24	50
20	210	387	593
21	100	50	145
22		212	797
23		141	281
24		124	231
25		113	205
26		117	238
27	7,965	87	188
28		651	1,004
29		101	105
30		80	90
31		208	404
32		306	698
33		459	731
TOTAL	9,055	3,825	7,368

Total Trap Sets/Acre - .42
Muskrats/Acre Harvest of Marsh - .81

TABLE NO. 2

SEX AND AGE RATIOS

Fresh Animals

Adult Male			Adult Female			Immature Male			Immature Female		
No.	Average Weight	Average Length	No.	Average Weight	Average Length	No.	Average Weight	Average Length	No.	Average Weight	Average Length
120	34.7	10.9	123	33.0	10.8	340	25.7	9.8	241	25.0	9.6

Cured-Pelt Primeness

Date	No. Aged	Ratio
11/17/66	175	59:116
11/18/66	53	18:35
11/21/66	176	81:95
12/14/66	204	109:95
12/29/66	290	148:142
01/10/67	244	101:143
01/25/67	435	164:271
02/09/67	100	27:73
	1,677	707:970 or 100:137 Adults:Immatures

Total muskrats age by pelt primeness patterns	1,677
Total fresh muskrats - aged, sexed, measured and weighed	824
Adult to Immature	100:198
Adult Male - Adult Female - Immature	100:100:198
Pelt Primeness - Adult to Immature	100:137

D. Waterfowl Banding

Seven young Canada geese were captured, banded and released on a nearby ranch.

Pre-season waterfowl banding commenced 8/23/67 when two funnel-type traps were activated in the South Sump, mainly for pintails. In 9 trap days, or 5 man-days, the pintail quota was reached.

Experimental night-lighting operations resulted in the capture of 78 waterfowl - all divers. This technique, with the proper equipment, could be an efficient way to capture waterfowl not usually captured by other means.

Pre-season mallard trapping commenced 8/26/67 and proceeded at a slow rate until about 9/15/67 when a new group of birds arrived. One funnel trap produced the quota in 37 trap days, or 14 man-days.

A special early spring trap was set to see the effects on a cinnamon teal concentration - results 49 banded teal in 3 man-days.

A total of 57 trap days, or 23 man-days, netted the following results:

Species	No. Banded
Canada Geese	7
Mallard	535
Pintail	560
Cinnamon Teal	49
Cinnamon or Blue-winged Teal	9
Redhead	24
Canvasback	16
Lesser Scaup	6
Ruddy	4
Green-winged Teal	2
Shoveler	1
American Coot	142
TOTAL	1,355

SIGNIFICANT RECOVERIES: 1967

Species	Banded At		Recovered At	
Starling	Ruby Lake N.W.R.	10/24/66	15 mi. N. Bakersfield, Calif.	03/--/67
Mourning Dove	Ruby Lake N.W.R.	05/17/66	Gallup, New Mexico	09/02/67
Mourning Dove	Ruby Lake N.W.R.	06/04/64	Los Lunas, New Mexico	09/02/67
Mourning Dove	Ruby Lake N.W.R.	05/09/65	30 mi. S. Vale, Oreg.	09/15/66
Canada Goose	Ruby Lake N.W.R.	12/01/60	Madera, California	01/03/67
Redhead	Ruby Lake N.W.R.	10/07/66	Culiacon Sinaloa, Mexico	03/--/67
Redhead	Ruby Lake N.W.R.	10/10/66	Ahome Sinaloa, Mexico	03/21/67

E. Mourning Dove Trapping

Mourning dove operations began 5/2/67 and ended 6/1/67. Good concentrations, 500 to 600, produced excellent catches in the headquarters area. One thousand six hundred fourteen doves received bands in 30 trapping days, or 15 man-days.

F. Seeding Trials - Standard Soil and Range Survey

An exclosure 100' X 100' was constructed in the North Sump for an experimental reed canary grass seed planting. The exclosure lies in the old lake bed, where 18 inches of peat has accumulated. The peat tests 7.20 pH. Approximately 2000 acres of denuded soil lies in the North Sump. The area is partially flooded in the spring and completely dry by the fall. The reed canary grass, if successful, will bind the soil and improve the range. A combination of small seedings accompanied the reed canary grass: Russian wildrye, alkar wheatgrass, alkali sacaton, Garrison foxtail and birdsfoot trefoil.

G. Perching Bird Banding

Perching bird banding, both mist-netting and decoy trapping, produced 1,687 banded birds, or which 47 are verified new additions to the Refuge Bird List. Fifteen of these are particularly interesting - the first recorded captures of certain species in the State of Nevada or dominate records for the northeastern section. Approximately 15 man-days were spent on this project. Tabulated results were:

PERCHING BIRD BANDING - 1967

Species	No. Banded	Species	No. Banded
Redwinged Blackbird	222	Mountain Bluebird	3
Yellow-headed Blackbird	608	Yellow-breasted Chat	14
Brewer's Blackbird	5	Cassin's Finch	6
Brown-headed Cowbird	225	Western Tanager	57
Pinon Jay	26	Killdeer	2
Common Crow	2	Hairy Woodpecker	1
California Quail	1	Robin	6
Oregon Junco	18	Cedar Waxwing	7
Pine Siskin	23	Poor-will	2
Audubon Warbler	7	Song Sparrow	62
American Goldfinch	2	Downy Woodpecker	1
Yellow Warbler	23	White-throated Sparrow	1
Chipping Sparrow	2	Bullock's Oriole	10
Wilson's Warbler	10	Black-headed Grosbeak	15
Empidonax Flycatcher	7	Evening Grosbeak	2
Lazuli Bunting	11	Green-tailed Towhee	3
Macgillivray's Warbler	3	Rufous-sided Towhee	1
Yellowthroat	4	Western Kingbird	1
Western Wood Pewee	26	Black-billed Magpie	1
Virginia's Warbler	1	Great Horned Owl	2
Warbling Vireo	14	Ruby-crowned Kinglet	1
White-crowned Sparrow	158	Lincoln's Sparrow	1
Say's Phoebe	1	Myrtle's Warbler	1
Northern Waterthrush	1	Savannah Sparrow	5
Barn Swallow	14	House Finch	1
Cliff Swallow	34	House Sparrow	1
Vesper Sparrow	1	Starling	3
Lark Sparrow	27	Belted Kingfisher	1
		TOTAL	1,687

Distributional and refuge bird list records were all identified at the U.S. National Museum, Washington, D.C. and the Nevada State Museum. All reside as prepared bird specimens in the respective museums. These records are tabulated on the next page.

DISTRIBUTIONAL RECORDS

Species	Record	Scientific Name	Identification
Lark Sparrow	#	Chrondestes grammacus strigatus	U.S. Museum
Yellow Warbler	#	Dendroica petechia morcomi	"
Green-tailed Towhee		Chlorura chlorura	"
Orange-crowned Warbler		Vermivora celata orestera	"
Blackpoll Warbler	** #	Dendroica striata lurida	"
Macgillivray's Warbler	**	Oporornis tolmiei tolmiei	"
Wilson's Warbler (2)	#	Wilsonia pusilla pileolata	"
Swainson's Thrush		Hylocichla ustulata almae	"
Hermit Thrush	#	Hylocichla guttata ssp.	"
Western Flycatcher	* #	Empidonax difficilis hellmayri	"
Hammond's Flycatcher	#	Empidonax hammondii	"
Indigo Bunting (2)	* #	Passerina cyanea	"
Traill's Flycatcher (2)	#	Empidonax traillii brewsteri	"
Red-eyed Vireo	** #	Vireo olivaceus ssp.	"
Olive-sided Flycatcher	#	Nuttallornis borealis	"
Brewer's Sparrow		Spizella breweri breweri	"
Barn Swallow		Hirundo rustica erythrogaster	"
Northern Waterthrush	** #	Seiurus novaboracensis	"
Chipping Sparrow		Spizella passerina boreophila	"
Starling (3)	#	Sturnus vulgaris vulgaris	"
Cassin's Finch	#	Carpodacus cassinii	"
Yellow-bellied Sapsucker (2)	#	Sphyrapicus varius nuchalis	"
Catbird	** #	Dumatella carolinensis ruficrissa	"
Warbling Vireo	#	Vireo gilvus leucopolius	"
Saw-whet Owl	* #	Aegolius acadicus acadicus	"
American Goldfinch (2)	#	Spinus tristis pallidus	"
Evening Grosbeak	#	Hesperiphona vespertina brooksi	"
Solitary Vireo	#	Vireo solitarius cassinii	"
Ruby-crowned Kinglet(2)	#	Regulus calendula cineraceus	"
Yellow-shafted Flicker	** #	Colaptes auratus luteus	"
Cowbird	#	Molothrus ater artemisiae	"
Band-tailed Pigeon	** #	Columba fasciata fasciata	"
Yellow-breasted Chat	#	Ictera virens auricollis	"
Harris' Sparrow	* #	Zonotrichia querula	"
Northern Shrike	#	Lanius excubitor invictus	"
White-throated Sparrow	#	Zonotrichia albicollis	"
Greater Scaup	* #	Aythya marila nearctica	"
Rose-breasted Grosbeak	** #	Pheucticus ludovicianus	"
Oregon Junco (4)		Junco oreganus montanus	"
Song Sparrow	#	Melospiza melodia montana	"
White-throated Swift	#	Aeronautes saxatalis	"
Lincoln's Sparrow	* #	Melospiza lincolnii	"
Golden-crowned Sparrow	#	Zonotrichia atricapilla	"
Slate-colored Junco	#	Junco hyemalis	"
Tree Sparrow	#	Spizella arborea	"
Scrub Jay (2)	#	Aphelocoma coerulescens	"
Myrtle Warbler	* #	Dendroica coronata	Nev. St. Museum
Audubon Warbler	#	Dendroica auduboni	"
Lesser Goldfinch	#	Spinus psaltria	"
Pine Siskin	#	Spinus pinus	"

*-Distributional Record Northeastern Nevada
**-Distributional Record State of Nevada
#-Distributional Record New Addition Refuge Bird List

H. Bass Tagging

Approximately 500 catchable-sized largemouth bass have been netted, tagged and released in various refuge waters. This cooperative study, mainly conducted by the Nevada Fish and Game, will evaluate angler harvest, bass growth rates and their movements. A summary will be shown in the narrative when results are completed.

I. Canada Goose Transplant

The Nevada State Fish and Game decided to move their flightless goose capturing program to within the Reno, Nevada city limits. This 3-year transplantation project was designed to establish a local nesting flock on the State's Sunnyside Wildlife Management Area. The name has recently been changed to Wayne Kirsch Wildlife Management Area. The young, flightless birds will be penned until the third year after capture. This year completed the collection of the nucleus breeding stock.

J. Goose Nesting Platform Trials

To date, 59 "Dill" type nesting platforms have been placed in representative goose nesting sites throughout the diked area. Four basket heights were used, ranging from 4 to 7 feet. The baskets were filled with meadow hay held firmly by a tire. Five locations enticed goose nesting activities in 1967. The intention of this study is to expand the goose nesting habitat. It seems that a marsh of this size and diversity should have more goose nesting potential than is now present. The nesting platform sites are selected in locations not naturally used for nesting. Included are small, low, water-soaked islands and shallow, water portions where the platforms have a good foundation. Some seasoning may be required before good use occurs.

K. Marsh Manipulation Study

Mr. Joseph M. Jarvis, a Masters candidate at Humbolt State College, has initiated a marsh study program that involves the experimental rejuvenation of Unit 21. The title, "Ecological Effects of Marsh Manipulation by Drawdown and Mechanical Removal of Vegetation", concerns three study areas. Data were collected on vegetation, water and soil properties in a controlled area, in the completed unit and a portion currently undergoing treatment. The objective is to develop guidelines in manipulating emergent vegetation by mechanical means and to determine the vegetative growth in marshes before, during and following manipulation or treatment. The before is Unit 20 where no disturbance has occurred; during is the

hardstem bulrush plowing and small dozed areas in the East Sump; following is what has and is happening in the treated Unit 21. Mr. Jarvis has collected some excellent material which was brought forth in his preliminary progress report. Joe will be back in the summer of 1968 to complete the project.

VI. PUBLIC RELATIONS

A. Recreational Use

Total annual recreational visitations increased only 150 visits over 1966. These were attributed, mainly, to waterfowl hunting. Miscellaneous visits dropped to 3,397, while fishing continued its' steady increase and reached 27,353. Total annual use rose to 31,750 visits.

Ruby comprises one of the only available water sources of this type in northeastern Nevada. A large percentage of water-oriented recreation is directed toward refuge lands because boating, fishing, water skiing, bird watching, hunting and just getting out or close to water exists. Excellent trout - brook, brown and rainbow - fishing plus an outstanding largemouth bass fishery drew people from many places. (See II, G. Fish.)

The Federal Recreation Conservation Permit was mandatory on refuge lands during 1967. Ruby was designated as a year-round Federal Recreation Area. Refuge personnel sold two types of permits - the $7 "Golden Eagle" and the $1 Day-Use. The general public opinion, both local and national, is favorable. Many people are beginning to see the great recreational benefits over the entire nation. A total of 513 $7 "Golden Eagles" and 325 $1 Day-Use permits were sold. The annual collection totaled $3,916.00.

B. Refuge Visitors

Important official visitors to the refuge were:

Name	Affiliation & Address	Date
Leland Campsey	Soil Conservation Service, Elko, Nevada	02/03/67
Edward Spencer	Soil Conservation Service, Elko, Nevada	02/03/67
Leonard Hoskins	Nevada Fish & Game, Elko, Nevada	02/03/67
Dean Hershey	U.S. Weather Bureau, Salt Lake City, Utah	05/04/67
Raymond Glahn	BSF&W, Pilot-Biologist, Portland, Oreg.	06/05/67
Robert Shields	BSF&W, Portland, Oregon	06/05 &06/06/67
George Webber	Bureau Outdoor Recreation, San Francisco	07/03/67
O. B. Howe	State B.L.M., Reno, Nevada	07/03/67
Darrell Short	B.L.M., Elko, Nevada	07/12/67

William Lindsey	Realty, BSF&W, Portland, Oregon	07/20/67
Thomas Smith	Realty, BSF&W, Portland, Oregon	07/20/67
O. B. Howe	State B.L.M., Reno, Nevada	08/10/67
Ron Batchelor,	Soil Conservation Service, Phoenix, Ariz.	08/15/67
John Johnston	Soil Conservation Service, Wells, Nev.	08/15/67
Frederick Kuhlman	B.L.M. Mining Engr., Battle Mts., Nev.	08/16/67

State Fish Hatchery Dedication 08/27/67

Mr. & Mrs. Paul Laxalt, Governor, Carson City, Nevada
John D. Findlay, Associate Director, BSF&W, Portland, Oregon
Frank Groves, Director, Nevada Fish & Game, Reno, Nevada
Dr. & Mrs. Harry Gallagher, Elko, Nevada
Mr. & Mrs. Carl Pacini, Nevada Fish & Game Commissioner, Elko, Nevada
Mr. & Mrs. Bruno Guisti, Nevada Fish & Game Commissioner, Lovelock Nev.
Donald Cavin, Nevada Fish & Game Commissioner, Hawthorne, Nevada
Mr. & Mrs. Arnold Millard, Nevada F & G Secretary, Carson City, Nevada
Mr. & Mrs. Edgar Siri, Nevada F & G Commissioner, Pahrump, Nevada
Dean Blake, Nevada F & G, Reno, Nevada
Loris Eldredge, Nevada F & G Secretary, Reno, Nevada
Robert Broadbent, Nevada F & G Commissioner, Reno, Nevada
Mr. & Mrs. Jack Dieringer, Nevada F& G, Reno, Nevada
Dale Lockard, Nevada F & G, Ely, Nevada
Lester Albright, Nevada F & G,Sunnyside Wildlife Management Area
Mr. & Mrs. Leonard Hoskins, Nevada F & G, Elko, Nevada
Mr. & Mrs. Hobart Leonard, Nevada F & G, Virginia City, Nevada
Joseph Greenley, Nevada F & G, Reno, Nevada
Fred Wright, Nevada F & G, Reno, Nevada
Matt Bernard, Nevada F & G, Minden, Nevada
Mr. & Mrs. Wayne Kirsch, Nevada F & G, Las Vegas, Nevada
Mr. & Mrs. Jerry Longero, Nevada F & G, Yerington, Nevada
Mr. & Mrs. Pete Andersen, Elko Co. Game Board, Elko, Nevada
Mr. & Mrs. Earl Frantzen, Elko Daily Free Press, Elko, Nevada
Nolan Kerl, Bureau Land Management, Reno, Nevada
Kent Giles, Bureau Land Management, Elko, Nevada
M. W. Buzan, Bureau Land Management, Reno, Nevada
Mr. & Mrs. Robert Rose, Savini Construction, Sparks, Nevada
Dr. & Mrs. Thomas Gallagher, Elko, Nevada
Dr. & Mrs. Morris Gallagher, Elko, Nevada
Mr. & Mrs. Otto Lynn, Former Hatchery Manager, Hagerman, Idaho
Mr. & Mrs. Patrick Coffin, Nevada F & G, Elko, Nevada
Mr. & Mrs. Warren Monroe, Senator, Elko, Nevada
Gene McDowell, Nevada F & G, Reno, Nevada
Joe Viani, Assemblyman, Reno, Nevada
Robert Hilts, Nevada F & G, Reno, Nevada
Eric Cronkite, Nevada State Parks, Carson City, Nevada
Paul Hayden, Savini Construction, Reno, Nevada
Jack Means, Design & Consulting Engrs, Reno, Nevada
John Anderson, Design & Consulting Engrs., Reno, Nevada

Raymond Glahn	BSF&W, Pilot-Biologist, Portland, Oreg.	09/06/67
Sanford Wilbur	BSF&W, Wildlife Mgt. Biologist, Portland	09/12-14/67
Bob Ortel	Bureau Land Management, Elko, Nevada	09/28/67
O. B. Howe	State, B.L.M., Reno, Nevada	09/28/67
W. F. Strojii	Desert Research Institute, Elko, Nevada	10/03/67
Vernon Ekedahl	Regional Supervisor, BSF&W, Portland	10/04/67
Alvin McLane	University of Nevada, Reno, Nevada	10/26/67
Craig Edlund	University of Nevada, Reno, Nevada	10/26/67
Peter J. Herlan	Nevada State Museum, Caron City, Nevada	11/08/67
Nick Papas	Nevada Fish & Game, Elko, Nevada	12/21/67
Walt James	Nevada Fish & Game, Elko, Nevada	12/21/67
Alan Flock	Nevada Fish & Game, Mountain City, Nev.	12/21/67

Numerous visits from employees of the Nevada District State Fish and Game office and Dr. Harry M. Gallagher Fish Hatchery.

C. Refuge Participation

Lewis - Attended monthly meetings of the Elko County Game Management Board to discuss refuge programs and projects.

Lewis - 5/2/67-Slide talk "Wildlife At Ruby" to the noon meeting of the Elko Lions Club.

Lewis - 5/2/67-Attended the Elko County Sportsmen's Club meeting to discuss fishing regulations.

Lewis - 7/13/67-Met with Bureau of Land Management on campgrounds and other recreational planning near the refuge.

Lewis - 9/28/67-Met with O. B. Howe, B.L.M., on recreation development.

Lewis - 11/3/67-Slide program to the Elko Civic Club on "The Desert Bighorn".

Lewis - 11/11/67-Slide talk "National Wildlife Refuges in Nevada" to the Ruby Valley 4-H members and their families on Club Achievement Night.

Lewis - 11/13/67-Met with B.L.M. on land exchange. The Bureau will withdraw 565 acres of land from B.L.M. as an addition to Ruby Lake Refuge. All other lands bordering the refuge, with the exception of a retained recreational site near Shanty Town, will be administered by the Forest Service.

Lewis - 11/28/67-Slide talk on "The Desert Bighorn" to the Jackpot Rod and Gun Club.

Creasy - For the months of February, March, October, November and December showed two films to the Ruby Valley Schools plus families at the Refuge and State Fish Hatchery.

Morrow - 9/21/67-Attended GSA "Defensive Driving Course" at Lamoille Canyon.

Lewis and Creasy - 2/13-2/17-67 To Portland to attend the Regional Refuge Manager's Conference.

Lewis and Creasy - 6/14/67-Tour of Refuge by 35 Nevada Range Group Boys and 6 instructors.

Lewis and Creasy - 6/20/67-Attended GSA "Defensive Driving Course" at B.L.M. office, Elko, Nevada.

Lewis and Creasy - 8/27/67-Attended the Dr. Harry M. Gallagher State Hatchery dedication.

Lewis and Creasy - 9/17-9/22/67 To Klammath Falls and Tule Lake for Banding and Law Enforcement Work Shop.

Lewis and Creasy - 10/1/67-Tour of Refuge by Ruby Valley 4-H Club. The boys and girls picked up litter to complete a group project.

D. Hunting

Waterfowl hunters developed great enthusiasm as opening day arrived. The refuge Public Hunting Area contained 5 to 6 thousand birds when the shooting commenced. An estimated 210 hunters harvested 591 waterfowl on the first weekend. Redheads, mallard, pintail, ruddy, canvasback and widgeon appeared most frequently in checked bags in this order of importance. Good hunter success (2.6 birds/hunter) continued throughout most of the season. Hunter participation, as a whole, exceeded 1966 by 400 use days and hunter hours reached 2,920, or about 6.2 hours/hunter visit.

The road along the western refuge boundary received moderate use from the beginning of dove season, through sage grouse season then switched to heavy use throughout the big game season. Hunter success on doves - poor; on sage grouse - poor; and on mule deer - good.

E. Violations

The refuge law enforcement program combines Nevada Fish and Game and refuge personnel; results of this activity are listed below:

Date	Name	Offense	Fine
2/18/67	Clark, Harold Eddie	No fishing license in possession	Warning
5/6/67	Bennett, James	No fishing license in possession	Warning
5/6/67	Davis, Billy Joe	No fishing license in possession	Warning
5/27/67	Wunderlick, William F.	No fishing license in possession	$ 50.00
6/17/67	Williams, Herbert L.	No fishing license in possession	20.00
6/18/67	Bartorelli, Mark	No fishing license in possession	Warning
7/8/67	Rowe, Dennis William	No life preserver	10.00
8/5/67	Reser, Ronald Gene	No life preserver	10.00
8/5/67	Larson, David H.	No life preserver	10.00
8/5/67	Hayward, William Earl	No life preserver	10.00
8/13/67	Martin, Ronald L.	Over-limit trout	50.00
8/13/67	Craig, Earl	No life preserver	10.00
8/13/67	Bogdon, Charles F.	No life preserver	10.00
8/14/67	Alanis, Richard Jess	Fishing - Hatchery Pond	50.00
8/15/67	Miller, James Jr.	Littering	50.00
8/20/67	Gardella, Raymond F.	No life preserver	Warning
9/3/67	Smith, Matt	No fishing license in possession	Warning
10/7/67	Bath, James H.	Waterfowl stamp on fishing license	Warning
10/7/67	Bough, Donald C.	Fishing 2 poles	50.00
		TOTAL	$330.00

VII. OTHER ITEMS

A. Items of Interest

The lost-time accident record now stands at 4,977 days. Our previous record was 63 days.

Assistant Manager Omer E. Larochelle was promoted to Manager-in-Charge at Modoc National Wildlife Refuge on January 30, 1967. Omer was replaced by Mr. James A. Creasy, a graduate of Nevada University and student assistant at Stillwater National Wildlife Refuge during the summer of 1966. Jim, his wife "Penny" and their two children fit well into refuge life.

Mr. Creasy was summoned by the Regional Office to assist in the botulism outbreak on Tulare Lake near Kern National Wildlife Refuge. Jim picked up sick and dead ducks from November 17 through December 1.

Two Great Basin Canada geese were collected in August to serve as specimens in Dr. Harold C. Hansen's study of the races of Canada geese in North America. Dr. Hansen is a Wildlife Specialist for the Illinois Natural History Survey, Urbana, Illinois.

At the July SAFETY and Staff Meeting Refuge Manager Lewis presented Maintenanceman II Gerald Morrow his 10 year Service Pin.

Credit is due Mr. James Creasy and Mrs. Virginia Lewis for their part in the preparation of this narrative.

B. Photographs

The following photographs supplemented refuge activities.

SIGNATURE PAGE

Submitted by:

Donald E. Lewis
(Signature)

Refuge Manager
(Title)

Date: February 27, 1968

Approved, Regional Office: JW

Date: 4-27-68

Robert L. Crawford
(Signature)

Assistant Regional Director
(Title)

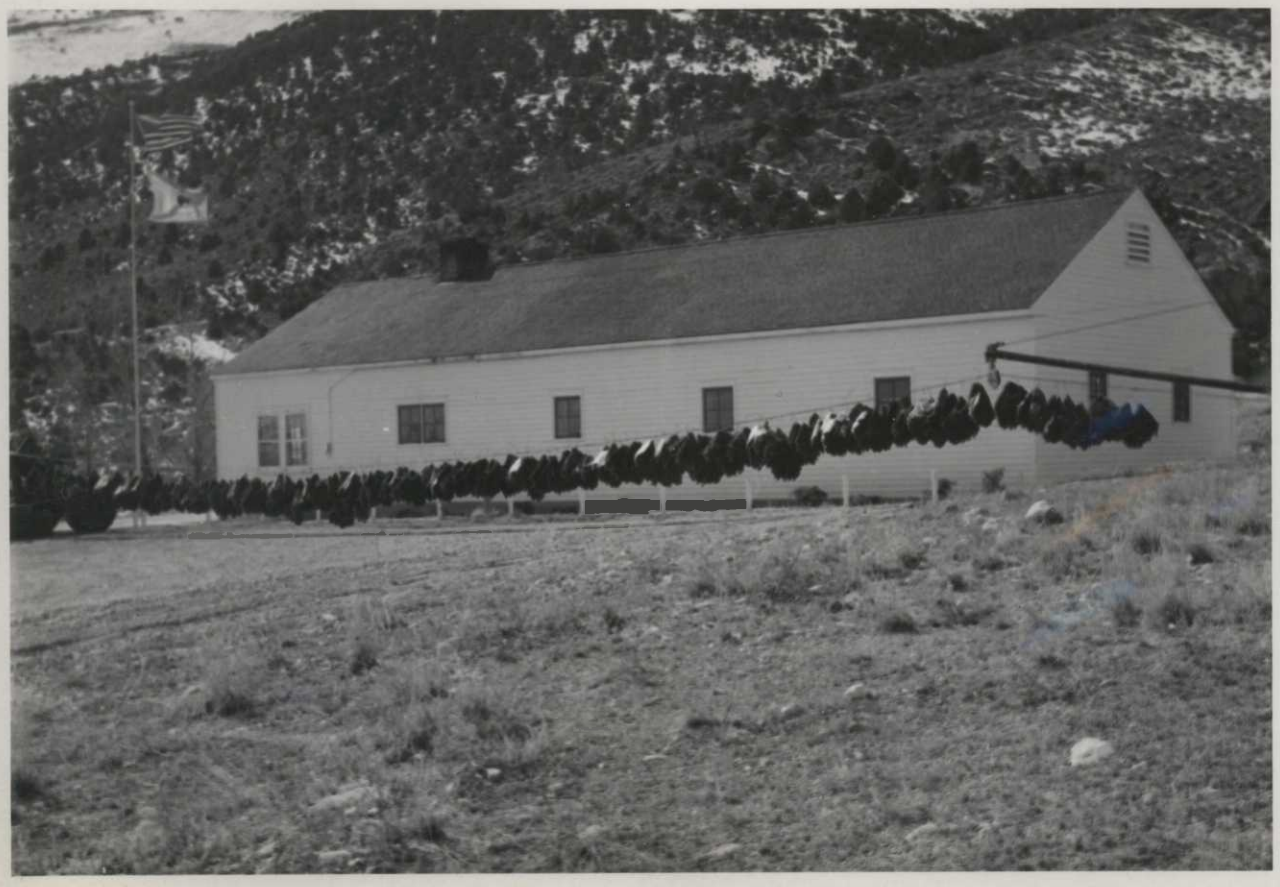
Refuge Manager:
Donald E. Lewis

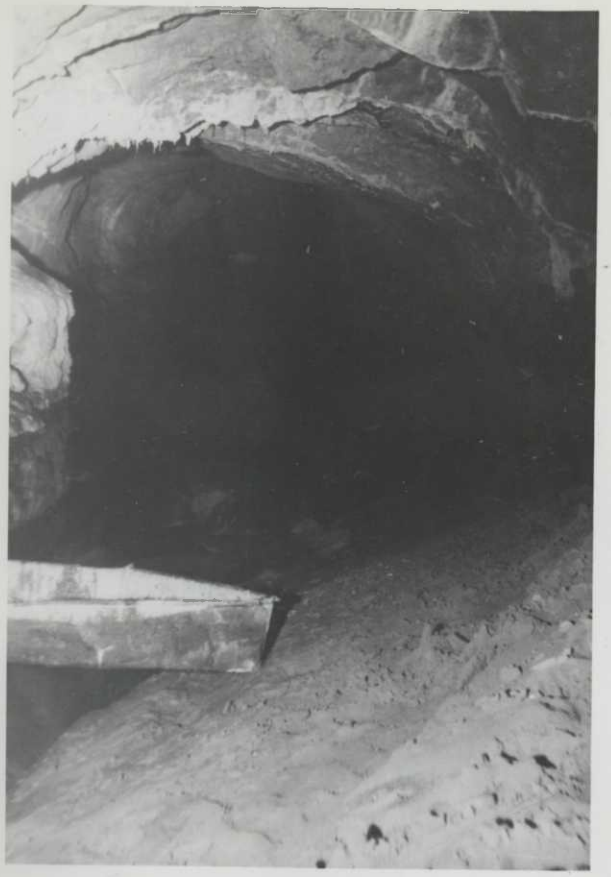
Assistant Manager:
James A. Creasy

Refuge Clerk:
Virginia Lewis

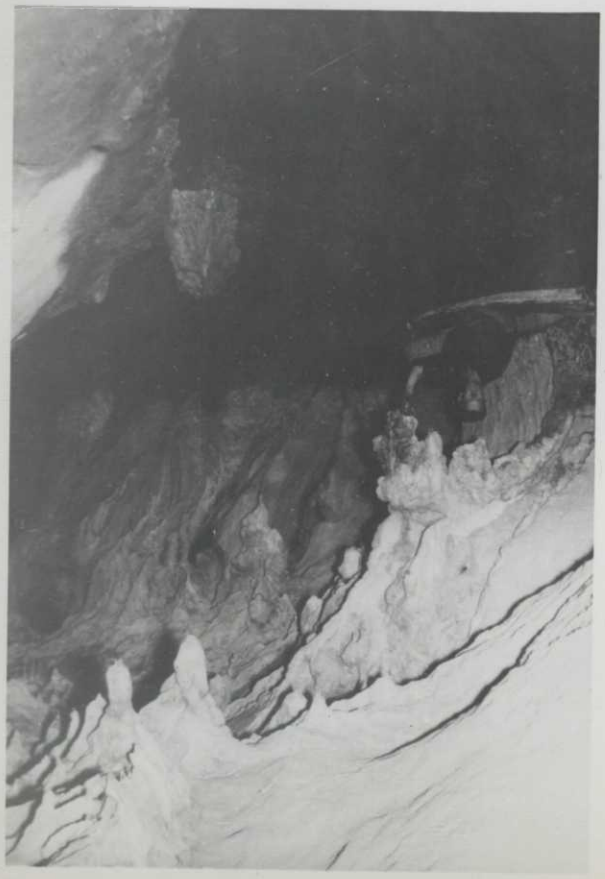
Maintenanceman II:
Gerald H. Morrow

Fifty-two feet, or 7,368 total muskrat pelts harvested during the 1967 season.





Cave Creek Cave at refuge headquarters explored more fully by boat to a distance of about 600 feet. Water depths vary from 2 to 10 to 12 feet. Water temperature - 42° F. Crystalline



limestone formations of aragonite, travertine and calcite are present. Water flows are visible from beneath a ledge that hangs below the water surface at the rear of the cavern.

Approximately 300 distinguished guests were present from all parts of Nevada to participate in the dedication ceremonies at the new Dr. Harry M. Gallagher State Fish Hatchery located on refuge lands. Associate Regional Director, John Findlay, talked of past and future cooperation. All guests received a chicken dinner, compliments of Ely and Elko merchants.

Wayne Kirch, Chairman of Nevada State Fish and Game Commissioners, tells of the hatchery construction. The silver structures in the background are feed bins; the terraced are 24 new rearing ponds. The office, shop and hatchery buildings are center left.

Down with the old, up with the new.

Rainbow, brook and brown trout rearing will be increased from 75,000 lbs. to 200,000 lbs. The $7 "Golden Eagle" contributed $321,000. Nevada sportsmen were extremely pleased.

Along with the public comes their official trade mark.

In order to effectively control water skiers, it was necessary to designate a controllable unit.

Funnel-type waterfowl traps produced well - mallards on the left and pintails on the right. The perching bird decoy trap was very effective on blackbirds, cowbirds and starlings. A young bobcat, accompanied by mama plus two brothers, thought mallard would taste good for supper. All four were trapped at the mallard banding site with the loss of only seven birds.

Water-oriented recreation is very popular in northeastern Nevada.

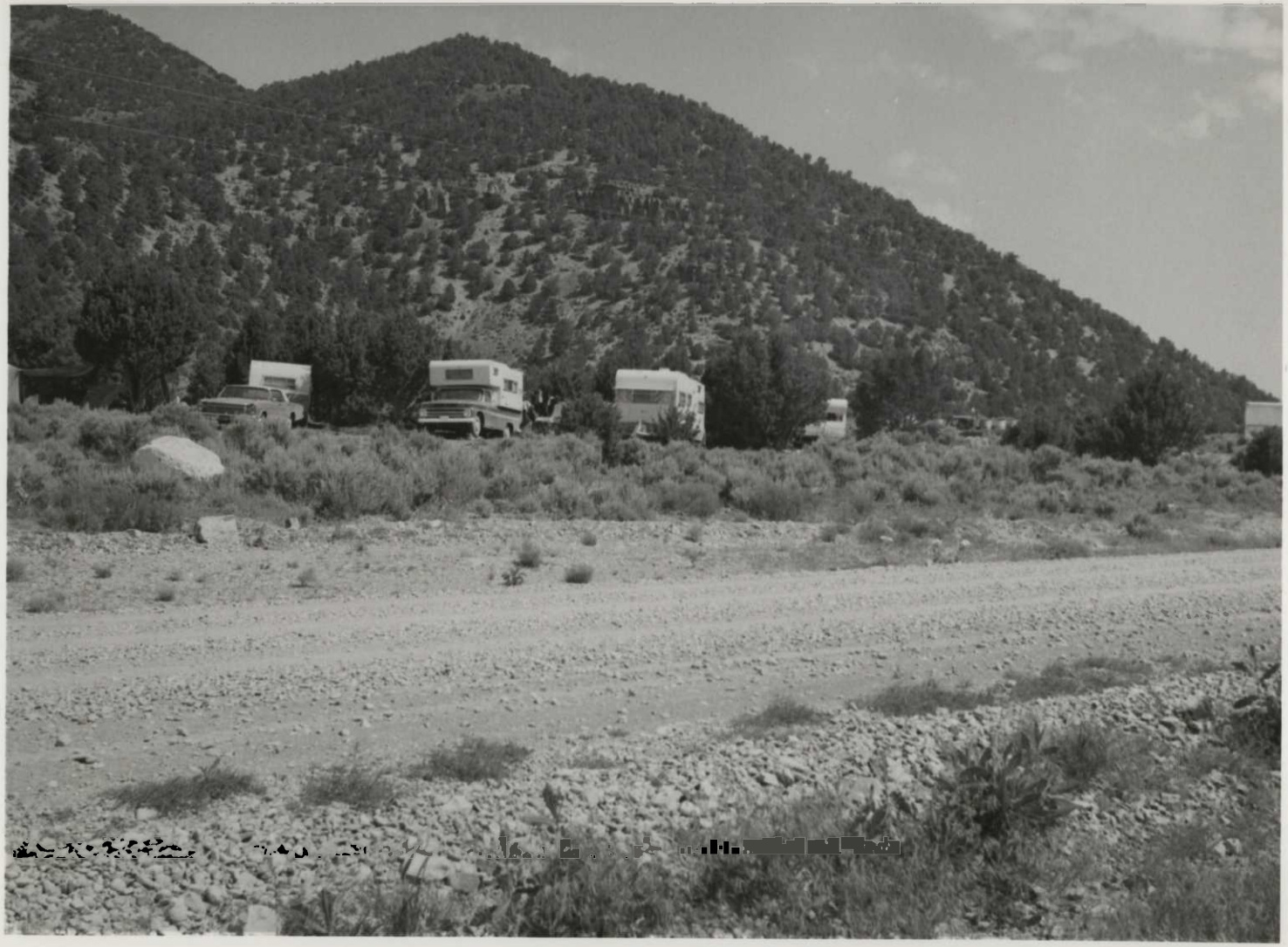
Refuge boat landing was a busy place. All this use and no camping facilities available.

The Ruby Valley 4-H Club had a field day; also, cleaned up a lot of litter.

59 goose nesting platforms were ready for "mama" goose.

Three stock watering facilities were totally completed.

A Happy California Angler
displays a nine pound rainbow, the largest fish caught in 1967.



The campers are located in the proposed Bureau of Land Management campsite. Future plans are to construct a 67 unit campground located centrally along the western refuge boundary.

Spring development provides proper water management. Controlled water can be directed toward irrigation or marsh management. Additional winter waterfowl habitat benefits the trumpeter swan.

Opposite page---
The little fellow catching largemouth bass could be heard 1/4 mile down the dike whenever he had a strike. For those who did not own a boat, dike fishing produced good catches.

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Ruby Lake MONTHS OF January TO April, 1967

(1) Species	(2) Weeks of reporting period: 1/1-7 (1)	1/8-14 (2)	1/15-21 (3)	1/22-28 (4)	1/29-2/4 (5)	2/5-11 (6)	2/12-18 (7)	2/19-25 (8)	2/26-3/4 (9)	3/5-11 (10)
Swans:										
Whistling	2	2	2	2	2	2	2	2		
Trumpeter	21	21	21	21	21	21	21	21	21	21
Geese:										
Canada					10	15	100	125	150	200
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	125	125	150	175	200	200	200	200	200	200
Black										
Gadwall	50	50	75	75	75	50	50	75	100	75
Baldpate	35	35	50	50	50	50	50	75	100	100
Pintail	25	25	25	50	50	50	50	100	100	100
Green-winged teal	10	10	25	25	25	25	50	100	125	400
Blue-winged teal										
Cinnamon teal										100
Shoveler	10	10	10	10	20	50	50	50	50	50
Wood										
Redhead	25	25	35	35	40	50	75	50	25	25
Ring-necked	10	10	25	25	50	50	50	50	75	75
Canvasback	10	10	10	10	10	10		25	25	25
Scaup, Lesser	75	75	75	75	75	100	75	50	75	75
Goldeneye	50	50	50	50	75	50	60	60	60	60
Bufflehead	25	25	25	25	50	100	100	100	100	100
Ruddy	25	25	25	25	50	50	50	50	50	50
Other Comm. Merganser					10	10	10	20	20	20
Red b. Merganser						10	10	10	10	10
Hooded Merganser							10	10	10	10
~~Misc.~~: TOTAL DUCKS	475	475	580	630	780	855	890	1,025	1,125	1,475
Coot:	100	100	175	175	200	250	300	300	300	400

Int. Dup. Sec.,
Wash., D. C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Ruby Lake MONTHS OF January TO April, 1967

(1) Species	(2) Weeks of reporting period: 3/12-18 (11)	3/19-25 (12)	3/26-4/1 (13)	4/2-8 (14)	4/9-15 (15)	4/16-22 (16)	4/23-29 (17)	(18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling									112		
Trumpeter	21	21	20	20	20	20	20		2,464		
Geese:											
Canada	225	225	250	250	250	250	250		16,100		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	300	400	400	600	1,000	1,100	1,100		46,725		
Black											
Gadwall	100	200	200	800	1,000	1,200	1,400		39,025		
Baldpate	100	200	300	500	500	500	500		22,365		
Pintail	100	100	200	300	400	600	600		20,125		
Green-winged teal	400	300	400	600	600	600	900		29,365		
Blue-winged teal	50	50	50	100	100	100	50		3,500		
Cinnamon teal	200	400	800	1,200	1,800	3,000	3,500		77,000		
Shoveler	50	50	50	50	200	200	200		7,770		
Wood	10	10	10	10	10	10	20		560		
Redhead	100	200	200	400	1,000	1,100	1,100		31,395		
Ring-necked	50	50	100	200	300	300	300		12,040		
Canvasback	100	200	300	500	1,200	1,200	1,200		33,845		
Scaup, Lesser	75	200	200	200	300	200	200		14,675		
Goldeneye	25	25			20	30	30		4,885		
Bufflehead	100	50	100	200	300	300	200		13,300		
Ruddy	50	50	50	100	100	200	200		8,050		
Other Comm. Merganser					20	20	10		980		
Red b. Merganser						10	10		490		
Hooded Merganser									280		
TOTAL DUCKS	1,810	2,485	3,360	5,760	8,850	10,670	11,120		366,555		
Coot:	3,000	4,000	6,000	12,000	12,000	14,000	14,000		471,100		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	2,576	23	
Geese	16,100	250	
Ducks	366,555	11,120	
Coots	471,100	14,000	

SUMMARY

Principal feeding areas Open marsh and collection ditch.

Principal nesting areas Grassy islands and marsh borders.

Reported by Donald E. Lewis, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Ruby Lake Months of January to April 1967

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Eared Grebe	Previous	Period	50	4/30	Still	Present				175
Pied-billed Grebe	"	"	15	4/20	"	"				100
White-faced Ibis	15	4/15	50	4/20	"	"				150
American Bittern	Permanent	Resident	100	4/25	"	"				100
Great Blue Heron	"	"	80	4/20	"	"				150
Snowy Egret	2	4/10	80	4/25	"	"				150
Black-crowned Night Heron	3	4/09	120	4/25	"	"				200
Sandhill Crane	2	3/09	40	4/30	"	"				75
II. Shorebirds, Gulls and Terns:										
Killdeer	Previous	Period	50	4/20	Still	Present				200
Common Snipe	Permanent	Resident	15	1/15	"	"				50
Long-billed Curlew	5	4/03	100	4/25	"	"				150
Spotted Sandpiper	10	4/15	200	4/20	"	"				300
Western Willet	2	4/03	50	4/25	"	"				50
Lesser Yellowlegs	3	4/25	10	4/26	"	"				10
American Avocet	2	3/31	25	4/15	"	"				100
California Gull	3	3/03	20	4/20	"	"				10
Forster's Tern	3	4/25	10	4/30	"	"				15

(over)

(1)	(2)		(3)		(4)		(5)				(6)
III. Doves and Pigeons:											
Mourning dove	1	4/03	600	4/30	Still	Present					2,000
White-winged dove											
IV. Predaceous Birds:											
Golden eagle	Permanent	Resident	5	4/20	Still	Present					6
Duck hawk											
Horned owl	"	"	20	4/25	"	"					30
Magpie	"	"	200	4/20	"	"					500
Raven	"	"	40	3/10	"	"					100
Crow	20	3/10	50	3/20	"	"					200
Turkey Vulture	2	3/09	80	4/30	"	"					150
Cooper's Hawk	Previous	Period	5	3/15	"	"					20
Red-tailed Hawk	"	"	10	2/15	"	"					20
Rough-legged Hawk	"	"	15	2/15	"	"					30
Bald Eagle	1	1/10	1	1/20	1	2/20					2
Marsh Hawk	Permanent	Resident	30	3/15	Still	Present					75
Osprey	1	4/15	1	4/20	"	"					2
Prairie Falcon	Previous	Period	8	3/18	"	"					15

Reported by Donald E. Lewis,
Refuge Manager

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INTERIOR--PORTLAND, OREGON

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Ruby Lake Months of January to April, 1967

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Sage Grouse	Upland sage, rabbitbrush and meadows 20,000 acres	80	5	20	1::1	0			225	Residents on and off use
California Valley Quail	Foothill drainages 225 acres	3	3	27	1::1	0			80	Resident population resulting from transplants
Chukar Partridge	Mountain foothills 8,000 acres	100			1::1	0			80	Resident population resulting from transplants
Gray Partridge	Mountain foothills 8,000 acres	160			1::1	0			50	Resident population resulting from transplants

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES:	Use correct common name.
(2) DENSITY:	Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
(3) YOUNG PRODUCED:	Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
(4) SEX RATIO:	This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
(5) REMOVALS:	Indicate total number in each category removed during the report period.
(6) TOTAL:	Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
(7) REMARKS:	Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Ruby Lake Year ending April 30, 1967

(1) Species	(2) Density		(3) Removals.					(4) Disposition of Furs						(5) Total Population
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator * Control	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
Mink	Marsh edges 2,000	200		2										10
Badger	Upland 27,000	1,350												20
Coyote	Upland & marsh 37,000	1,480												25
Bobcat	Upland 27,000	1,350												20
Muskrat	Marsh 12,000	0.6		7368				T-6642* T-7013* T-7014*	5526	1842	1842	0	0	20,000

* List removals by Predator Animal Hunter

REMARKS: *All three Trapper permits are combined in total furs.

Reported by Donald E. Lewis, Refuge Manager

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.

REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

32715

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Ruby Lake MONTHS OF May TO August, 1967

(1) Species	(2) Weeks of reporting period									
	4/30-5/6 (1)	5/7-13 (2)	5/14-20 (3)	5/21-27 (4)	5/28-6/3 (5)	6/4-10 (6)	6/11-17 (7)	6/18-24 (8)	6/25-7/1 (9)	7/2-8 (10)
Swans:										
Whistling										
Trumpeter	20	20	20	20	20	20	20	20	20	20
Geese:										
Canada	250	250	250	250	250	250	250	250	250	250
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Black										
Gadwall	1,400	1,400	1,400	1,500	1,500	1,100	1,100	1,100	1,100	1,100
Baldpate	500	500	150	150	150	50	50	50	50	50
Pintail	600	500	200	200	200	200	200	200	200	200
Green-winged teal	500	200	50							
Blue-winged teal	50	50	50	50	50	50	50	50	50	50
Cinnamon teal	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Shoveler	200	200	200	200	200	150	150	150	150	150
Wood	20	10	10	10	10					
Redhead	1,200	1,200	1,200	1,100	1,100	1,000	1,000	1,000	1,000	1,000
Ring-necked	300	400	400	400	400	200	200	200	200	200
Canvasback	1,200	1,200	1,200	1,200	1,200	1,100	1,100	1,100	1,100	1,100
Scaup	200	300	300	300	300	300	300	300	300	300
Goldeneye										
Bufflehead	200	50	25	25	25					
Ruddy	200	300	300	200	200	200	200	200	200	200
Other Comm. Merganser	10	10	10	10	10					
TOTAL DUCKS	11,280	11,020	10,195	10,045	10,045	9,050	9,050	9,050	9,050	9,050
Coot:	14,000	14,000	15,000	15,000	15,000	12,000	12,000	12,000	12,000	12,000

Int. Dup. Sec.,
Wash., D. C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Ruby Lake MONTHS OF May TO August, 19 67

(1) Species	(2) Weeks of reporting period: 7/9-15 (1)	7/16-22 (2)	7/23-29 (3)	7/30-8/5 (4)	8/6-12 (5)	8/13-19 (6)	8/20-26 (7)	8/27-9/2 (8)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling											
Trumpeter	20	20	21	21	21	21	21	13	2,506	1	1
Geese:											
Canada	550	550	550	550	550	550	590	290	46,200	20	180
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	1,200	1,200	1,200	1,200	1,300	1,200	1,400	1,400	154,700	54	950
Black											
Gadwall	1,100	1,100	1,100	1,000	1,200	1,200	1,200	1,000	151,200	24	480
Baldpate	50	50	150	200	200	200	200	250	21,000	8	90
Pintail	200	200	500	600	1,000	1,500	5,500	4,500	116,900	12	75
Green-winged teal			100	300	800	900	900	2,000	40,250	0	0
Blue-winged teal	50	50	50	100	100	150	150	50	8,400	4	50
Cinnamon teal	3,500	3,500	3,500	3,400	3,200	3,300	3,300	2,500	430,500	122	1,250
Shoveler	150	150	150	200	200	200	200	200	22,400	12	150
Wood			10	10	10	10	10	10	840	0	0
Redhead	1,000	1,000	1,100	1,100	1,200	1,200	1,200	800	135,800	65	1,000
Ring-necked	200	200	200	300	300	200	200	100	32,200	5	180
Canvasback	1,100	1,100	1,100	1,100	1,200	1,200	1,200	800	142,100	42	750
Scaup	300	300	300	300	300	300	300	300	37,100	20	450
Goldeneye											
Bufflehead									2,275	0	0
Ruddy	200	200	200	200	250	200	200	200	26,950	21	225
Other Com. Merganser									350	0	0
TOTAL DUCKS	9,050	9,050	9,660	10,010	11,560	11,760	15,960	14,110	1,322,965		5,610
Coot:	12,000	12,000	12,000	13,000	14,000	14,000	14,000	12,000	1,652,000	425	6,500

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	2,506	21	1
Geese	46,200	550	200
Ducks	1,322,965	15,960	5,610
Coots	1,652,000	15,000	6,900

SUMMARY

Principal feeding areas Shallow ponds, diked units and open marsh.

Principal nesting areas Grassy ditch and dike banks, meadows, bardstem and islands.

Reported by Donald E. Lewis, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Ruby Lake Months of May to August 195/ 67

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Eared Grebe	Previous Period		85	8/25	Still	Present	0	0	0	130
Pied-billed Grebe	"	"	120	8/15	"	"	1	50	125	250
White Pelican	1	5/20	1	5/20	1	5/20	0	0	0	1
Great Blue Heron	Permanent Resident		60	6/15	Still	Present	1	20	50	125
Snowy Egret	Previous Period		90	6/20	"	"	1	15	35	160
Black-crowned Night Heron	"	"	50	6/18	"	"	1	15	35	120
American Bittern	Permanent Resident		70	6/13	"	"	0	0	0	100
White-faced Ibis	Previous Period		200	7/10	"	"	0	20	32	240
Sandhill Crane	"	"	50	6/18	"	"	0	20	25	110
II. Shorebirds, Gulls and Terns:										
Killdeer	Previous Period		170	7/16	Still	Present	0	65	130	380
Common Snipe	Permanent Resident		50	7/22	"	"	0	0	0	120
Long-billed Curlew	Previous Period		120	7/14	"	"	0	30	75	210
Spotted Sandpiper	"	"	250	8/11	"	"	0	30	65	400
Western Willet	"	"	100	8/11	"	"	0	40	90	200
Lesser Yellowlegs	"	"	50	8/25	"	"	0	0	0	75
American Avocet	"	"	50	7/24	"	"	0	10	30	100
California Gull	"	"	20	8/18	"	"	0	0	0	30
Forster's Tern	"	"	10	7/20	"	"	0	0	0	25
Black Tern	5	5/10	50	7/11	"	"	0	0	0	75

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. Doves and Pigeons:	Previous	Period	2,000	5/15	Still	Present	0	200	450	5,000
Mourning dove										
White-winged dove										
IV. Predaceous Birds:	Permanent	Resident	3	5/7	Still	Present	0	0	0	10
Golden eagle										
Duck hawk	"	"	20	6/12	"	"	0	0	0	30
Horned owl	"	"	300	7/18	"	"	0	75	225	500
Magpie	"	"	60	7/25	"	"	0	10	40	120
Raven	Previous	Period	80	8/12	"	"	0	15	60	160
Crow	"	"	80	8/25	"	"	0	0	0	100
Turkey Vulture	"	"	5	5/15	"	"	0	0	0	10
Cooper's Hawk	"	"	8	7/20	"	"	0	0	0	12
Red-tailed Hawk	"	"	6	8/12	"	"	0	0	0	11
Rough-legged Hawk	Permanent	Resident	30	7/15	"	"	0	0	0	50
Marsh Hawk	Previous	Period	8	8/25	"	"	0	0	0	15
Prairie Falcon	2	5/10	20	5/15	"	"	0	0	0	40
Sparrow Hawk										

Reported by James Creasy

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INTERIOR--PORTLAND, OREGON

3-1750b
Form NR-1B
(Rev. Nov. 1957)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Ruby Lake For 12-month period ending August 31, 19 67

Reported by Donald Lewis Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage		(3) Use-days	(4) Breeding Population	(5) Production
North Sump I	Crops	0	Ducks	180,000	600	250
	Upland	10,000	Geese	5,000	10	20
	Marsh	4,000	Swans	2,000	0	0
	Water	0*	Coots	190,000	200	150
	Total	14,000	Total	377,000	810	420
Developed Units II	Crops	45	Ducks	1,225,000	4,700	3,280
	Upland	3,000	Geese	55,090	160	210
	Marsh	2,700	Swans	12,500	10	1
	Water	0*	Coots	1,300,000	3,700	2,200
	Total	5,745	Total	2,592,590	8,570	5,691
South Sump III	Crops	40	Ducks	1,504,340	4,500	2,080
	Upland	8,006	Geese	30,000	80	50
	Marsh	9,400	Swans	5,625	4	0
	Water	0*	Coots	2,118,850	4,100	4,150
	Total	17,446	Total	3,658,815	8,684	6,280
Total	Crops	85	Ducks	2,909,340	9,800	5,610
	Upland	21,006	Geese	90,090	250	280
	Marsh	16,100	Swans	20,125	14	1
	Water	0*	Coots	3,608,850	8,000	6,500
	Total	37,191	Total	6,628,405	18,064	12,391
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
*All water areas included in marshland	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

(2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

(3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

(4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.

(5) **Production:** Estimated total number of young raised to flight age.

Interior Duplicating Section, Washington, D. C. 27580

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Ruby Lake Months of May to August, 19 67

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Sage Grouse	Upland sage, rabbitbrush and meadows 20,000 acres	80	5	20	1:1	0			225	Residents on and off use
California Valley Quail	Foothill drainages 225 acres	3	3	27	1:1	0			80	Resident population resulting from transplants
Chukar Partridge	Mountain foothills 8,000 acres	100	2	20	1:1	0			80	Resident population resulting from transplants
Gray Partridge	Mountain foothills 8,000 acres	160	0	12	1:1	0			50	Resident population resulting from transplants

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

1613

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE Ruby Lake MONTHS OF September TO December, 1967

(1) Species	(2) Weeks of reporting period: 9/3-9 1	9/10-16 2	9/17-23 3	9/24-30 4	10/1-7 5	10/8-14 6	10/15-21 7	10/22-28 8	10/29-11/4 9	11/5-11 10
Swans:	Aerial									
Whistling										7
Trumpeter	13	13	13	13	18	10	18	18	18	18
Geese:										
Canada	250	250	250	250	200	150	300	300	250	275
Cackling										
Brant										
White-fronted										
Snow							1			
Blue										
Other										
Ducks:										
Mallard	1,400	1,400	1,400	1,400	1,800	2,000	2,000	2,000	2,500	2,500
Black										
Gadwall	800	800	800	800	1,200	1,600	1,800	2,000	2,000	2,000
Baldpate	300	300	300	300	1,000	1,825	1,825	1,825	1,900	2,000
Pintail	4,000	4,000	4,000	4,000	1,500	900	900	900	1,200	1,200
Green-winged teal	3,900	3,900	3,900	3,900	1,000	500	500	500	500	500
Blue-winged teal	50	50	50	50	50	50	50	50	50	50
Cinnamon teal	2,000	2,000	2,000	2,000	2,000	1,600	1,500	1,500	500	500
Shoveler	200	200	200	200	200	200	300	500	600	600
Wood	10	10	10	10	10	10	10	10	10	10
Redhead	600	600	600	600	800	925	950	950	1,000	1,200
Ring-necked	100	100	100	100	100	100	100	100	100	100
Canvasback	600	600	600	600	650	625	650	700	750	850
Scaup, Lesser	300	300	300	300	300	300	300	400	500	600
Goldeneye, Comm. & Barrows								25	50	50
Bufflehead								100	200	200
Ruddy	200	300	300	500	400	300	300	300	300	500
OtherComm. Merganser										
Red b. Merganser										
Hooded Merganser										
TOTAL DUCKS	14,460	14,560	14,560	14,760	11,010	10,935	11,185	11,860	12,160	12,860
Coots:	11,000	15,000	15,000	15,000	20,000	23,800	23,800	23,800	24,000	28,000

Int. Dup. Sec.,
Wash., D. C. 37944

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Ruby Lake MONTHS OF September TO December, 1967

(1) Species	(2) Weeks of reporting period: 11/12-18 (11)	11/19-25 (12)	11/26-12/2 (13)	12/3-9 (14)	12/10-16 (15)	12/17-23 (16)	12/24-30 (17)	(18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling	7				50				448		
Trumpeter	18	18	18	18	18	18	18		1,946		
Geese:											
Canada	300	300	300	300	0	0	0		25,725		
Cackling											
Brant											
White-fronted											
Snow									7		
Blue											
Other											
Ducks:											
Mallard	2,500	2,500	500	750	200	200	200		176,750		
Black											
Gadwall	2,000	2,000	200	100	50	50	50		127,750		
Baldpate	2,000	2,000	200	200	20	20	40		112,385		
Pintail	800	500	300	200	50	75	90		172,305		
Green-winged teal	500	500	200	150	75	50	50		144,375		
Blue-winged teal									3,500		
Cinnamon teal	200	100	50	50		20	20		112,280		
Shoveler	600	400	100	100	20	20	20		31,220		
Wood									700		
Redhead	800	800	50	50	20	50	30		70,175		
Ring-necked	100	100	50	100	100	100	75		11,375		
Canvasback	700	600	25	25	20	20	20		56,245		
Scaup, Lesser	500	400	100	150	50	50	50		34,300		
Goldeneye, Comm. & Barr.	50	100	30	85	70	70	80		4,270		
Bufflehead	600	600	200	200	200	200	150		18,550		
Ruddy	500	300	50	50	50	75	75		31,500		
Other Comm. Merganser	10	10	10	10	10	10	5		455		
Red b. Merganser					10	10	5		175		
Hooded Merganser				5	5	5	5		140		
TOTAL DUCKS	11,860	10,910	2,065	2,225	950	1,025	965		1,108,450		
Coots:	25,000	23,000	1,000	1,000	100	100	100		1,747,900		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	2,394	68	
Geese	25,732	301	
Ducks	1,108,450	14,760	
Coots	1,747,900	28,000	

SUMMARY

Principal feeding areas Diked units, South Sump and refuge grain fields.

Principal nesting areas ---

Reported by James Creasy, Ass't Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge Ruby Lake Months of September to December 1967

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Eared Grebe	Previous	Period	150	9/20	5	11/10				250
Pied-billed Grebe	"	"	75	9/20	Still	Present				125
White Pelican	12	10/15	20	10/20	10	11/10				25
Great Blue Heron	Permanent	Resident	100	10/20	Still	Present				150
Snowy Egret	Previous	Period	125	10/20	5	11/10				150
Black-crowned Night Heron	"	"	60	10/20	10	11/10				120
American Bittern	Permanent	Resident	100	10/20	Still	Present				125
White-faced Glossy Ibis	Previous	Period	200	9/6	7	10/30				250
Sandhill Crane	"	"	230	11/15	5	11/20				250
II. Shorebirds, Gulls and Terns:										
Killdeer	Previous	Period	250	9/6	Still	Present				400
Common Snipe	Permanent	Resident	50	9/6	"	"				120
Long-billed Curlew	Previous	Period	100	9/15	10	9/25				200
Spotted Sandpiper	"	"	400	9/20	50	10/10				500
Western Willet	"	"	100	9/6	5	10/10				200
Lesser Yellowlegs	"	"	50	9/6	10	10/10				75
American Avocet	"	"	100	9/6	5	9/25				150
California Gull	"	"	20	9/6	2	10/10				30
Forster's Tern	"	"	30	9/6	3	9/25				40
Black Tern	"	"	50	9/6	2	9/25				75

(over)

(1)	(2)		(3)		(4)		(5)	(6)
III. Doves and Pigeons:								
Mourning dove	Previous	Period	500	9/16	2	11/25		1,000
White-winged dove								
IV. Predaceous Birds:								
Golden eagle	Permanent	Resident	4	11/20	Still	Present		6
Duck hawk	2	10/15	2	10/15	2	10/15		3
Horned owl	Permanent	Resident	20	9/6	Still	Present		30
Magpie	"	"	400	11/20	"	"		500
Raven	"	"	60	11/20	"	"		100
Crow	Previous	Period	100	11/20	20	11/30		150
Turkey Vulture	"	"	80	9/6	2	10/15		100
Cooper's Hawk	"	"	12	10/20	Still	Present		15
Red-tailed Hawk	"	"	6	10/20	"	"		10
Rough-legged Hawk	"	"	10	10/20	"	"		15
Bald Eagle	1	12/20	2	12/25	"	"		3
Marsh Hawk	Permanent	Resident	30	9/6	"	"		50
Osprey	1	11/25	1	12/25	1	12/25		1
Prairie Falcon	Previous	Period	8	9/6	2	11/25		10
Sparrow Hawk	"	"	20	9/6	4	11/25		40

Reported by James Creasy, Ass't Manager

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

36104

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

Refuge **Ruby Lake** Year 1967

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
10/7-13	125	853	Lesser Scaup 6, Redhead 147, Canvasback 21, Mallard 33, Ruddy 21, Pintail 27, Widgeon 12, Bufflehead 9, Shoveler 9, Cinnamon Teal 21, Gadwall 6	312	40	352	210	591
10/14-20	65	390	Redhead 81, Mallard 19, Pintail 12, Gadwall 9, Bufflehead 6, Ruddy 8	135	30	165	120	305
10/21-27	52	315	Redhead 62, Mallard 7, Pintail 14, Gadwall 8, Bufflehead 10, Ruddy 12, Lesser Scaup 6	119	16	135	100	260
10/28-11/3	38	225	Mallard 23, Redhead 30, Gadwall 4, Coot 12, Canvasback 6, Bufflehead 4, Ruddy 12	91	8	99	90	235
11/4-10	32	190	Mallard 8, Widgeon 7, Redhead 5, Gadwall 7, Canvasback 1, Ruddy 2, Coot 1, Bufflehead 1	32	5	37	80	92
11/11-17	28	170	Mallard 32, Gadwall 12, Green-winged Teal 12, Redhead 11, Goldeneye 2, Coot 9, Ruddy 8	86	9	95	80	271
11/18-24	31	180	Mallard 23, Shoveler 21, Widgeon 9, Redhead 5, Ruddy 17, Goldeneye 6, Coot 12	93	11	104	80	268
11/25-12/1	30	180	Mallard 24, Green-winged Teal 18, Ruddy 11, Shoveler 11, Redhead 9, Widgeon 11, Coot 5	89	8	97	60	194
12/2-8	22	135	Mallard 9, Redhead 4, Green-winged Teal 7, Coot 2, Goldeneye 2, Ruddy 4, Widgeon 4, Shoveler 4	36	4	40	50	91
12/9-15	26	150	Mallard 11, Green-winged Teal 21, Coot 5, Shoveler 8, Redhead 4, Widgeon 11, Ruddy 12	72	9	81	70	218
12/16-22	22	132	Mallard 7, Green-winged Teal 6, Shoveler 2, Coot 2, Ruddy 2, Gadwall 1, Widgeon 1	21	3	24	60	65
12/23-29	0	0	None	0	0	0	0	0
12/30-1/4	0	0	None	0	0	0	0	0
	471	2,920		1,086	143	1,229	1,000	2,590
	6.2 hrs./hunter		Waterfowl Season: October 7 - January 4				2.6 birds/hunter	

(over)

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spent hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 percent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Ruby Lake Months of September to December, 19 67

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Sage Grouse	Upland sage, rabbitbrush and meadows 20,000 acres	87	—	—	1::1	0	0	0	230	Residents on and off use
California Valley Quail	Foothill drainages 400 acres	4	—	—	1::1	0	0	0	100	Resident population resulting from transplant
Chukar Partridge	Mountain foothills 8,000 acres	100	—	—	1::1	0	0	0	80	Resident population resulting from transplant
Gray Partridge	Mountain foothills 8,000 acres	160	—	—	1::1	0	0	0	50	Resident population resulting from transplant
										Records by sight and estimation of populations.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Ruby Lake Calendar Year 1967

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re-stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
Mule Deer	Upland sage, rabbitbrush and meadows 27,000 acres	10	0	0	0	0	0	0	0	0	—	1,000*	400	1 buck: 4 does

*migrating and wintering animals

Remarks:

Reported by Donald E. Lewis, Refuge Manager

INSTRUCTIONS

Form NR-3 - BIG GAME

(1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.

(2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

(4) REMOVALS: Indicate total number in each category removed during the year.

(5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.

(6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.

(7) TOTAL REFUGE POPULATION: Give the estimated population of <u>each species</u> on the refuge at period of its greatest abundance and also as of Dec. 31.

(8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1755
Form NR-5

DISEASE

Refuge Ruby Lake Year 19 67

Botulism None

Lead Poisoning or other Disease None

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl		
(b) Shorebirds		
(c) Other		

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.

Condition of vegetation and invertebrate life _____

Remarks _____

Kind of disease _____

Species affected _____

Number Affected

Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

INT.-DUP., D.C.- 53818-59

NR-6

Bureau of Sport Fisheries and Wildlife

PUBLIC RELATIONS

(See Instructions on Reverse Side)

Refuge **Ruby Lake** Calendar Year **1967**

1. Visits

a. Hunting **1,000** b. Fishing **27,353** c. Miscellaneous **3,397** d. TOTAL VISITS **31,750**

1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl	1,000	9,000	Refuge
Upland Game			
Big Game			
Other			

Number of permanent blinds **0**

Man-days of bow hunting included above **0**

Estimated man-days of hunting on lands adjacent to refuge **800**

1b. Fishing (area open to fishing on refuge lands)

TYPE OF AREA	ACRES	MILES
Ponds or Lakes	10,000	
Streams and Shores		1

1c. Miscellaneous Visits

Recreation **3,197** Official **50**

Economic Use **150** Industrial **0**

2. Refuge Participation (groups)

TYPE OF ORGANIZATION	ON REFUGE NO. OF GROUPS	ON REFUGE NUMBER IN GROUPS	OFF REFUGE NO. OF GROUPS	OFF REFUGE NUMBER IN GROUPS
Sportsmen Clubs	4	72	12	250
Bird and Garden Clubs	2	18		
Schools	8	280	8	240
Service Clubs				
Youth Groups	4	240	3	125
Professional-Scientific	5	40	2	50
Religious Groups				
State or Federal Govt.	2	40	5	100
Other				

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	40	Radio Presentations	2
Newspapers (P.R.'s sent to)	15	Exhibits	0
TV Presentations	0	Est. Exhibit Viewers	0

3-1756

(Rev. 4/63)

INSTRUCTIONS

Item 1: Total of a, b, and c, equal d.

"Visit" - definition. Any person who is on refuge lands or waters during a day or part thereof for the purpose of: hunting, fishing, bird-watching, recreation, business or economic use, official visit, or similar interest. INCLUDE - those who stop within the refuge while traveling on a public highway because of an interest in the area. EXCLUDE - persons engaged in oil or other industry not directly related to the refuge, persons using refuge as most direct route or principal avenue of traffic, and those boating on navigable rivers or the Intercoastal Canal, unless they stop to observe wildlife on the refuge.

Computing visits. Where actual counts are impractical, "sampling" is used with midweek and week-end samples varied by season or weather. A conversion factor of 3.5 (of passengers per car) is used when accurate figures are not available. Each refuge will develop a conversion factor for boats based on range of usage. Count a camper once for each 24-hour period or fraction thereof.

Item 1a: Acres - of refuge open for each type of hunting.

Managed hunts require check in and out of hunters, issuance of permits, or assignment of blinds.

Other - INCLUDE crow, fox, and similar hunting.

Lands adjacent to refuge. Normally considered within 1 mile or less of boundary, unless established sampling procedures cover a wider area. For big game hunting, the distance may be greater.

Item 1b: Acres of streams open to fishing, if practical; otherwise just miles open. Information on "shores" is primarily for coastal fishing.

Item 1c: Recreation. INCLUDE photography, observing wildlife, picnicking, swimming, boating, camping, visitor center use, tours, etc. TOTAL Recreation, Official, and Economic Use visits under Item 1.

Industrial. INCLUDE persons engaged in industry, i.e., oil industry or factories. EXCLUDE these from Item 1.

Item 2: INCLUDE the "On Refuge" groups in Items 1c and 1. In "Off Refuge" column include only those group meetings in which refuge employees actually participate. EXCLUDE these from Items 1c and 1.

Item 3: Exhibits - INCLUDE displays, fairs, parades, and exhibits OFF the refuge; EXCLUDE those ON.

INTERIOR--PORTLAND, OREGON

3-1757
Form NR-7
(Rev. June 1960)

(1)

NONAC CULT AL COLLECTIONS, RECEIPTS, ND P NTINGS

Refuge Ruby Lake Year 19 67

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
NONE							NONE						

(1) Report agronomic farm crops on Form NR-8
(2) C = Collections and R = Receipts
(3) Use "S" to denote surplus

Total acreage planted:
Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

Remarks: _____

INTERIOR--PORTLAND, OREGON

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Ruby Lake County Elko State Nevada

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Common rye	0	0	0	0	85	1,900 Bu. 1,200 Lb.	85	Green brouse, hay and mature grain	85
								Fallow Ag. Land	

No. of Permittees: Agricultural Operations 0 Haying Operations 0 Grazing Operations 5

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
None				1. Cattle	1,267	3,947.62	$5,960.44	18,100
				2. Other Horses	57	500.17	1,000.34	18,100
				1. Total Refuge Acreage Under Cultivation				85
Hay - Wild				2. Acreage Cultivated as Service Operation				85

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C. 91767

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Ruby Lake County White Pine State Nevada

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Waterfowl Browsing Crops Type and Kind	Total Acreage
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
NONE									
								Fallow Ag. Land	

No. of Permittees: Agricultural Operations 0 Haying Operations 0 Grazing Operations 3

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
NONE				1. Cattle	1043	2734.39	$4,070.76	5,391
				2. Other Horses	10	54.60	109.20	5,391
				1. Total Refuge Acreage Under Cultivation				0
Hay - Wild				2. Acreage Cultivated as Service Operation				0

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

INT.-DUP. SEC., WASH., D.C. 91767

3-1570
NR-8a

REFUGE GRAIN REPORT

Refuge Ruby Lake Months of January through December, 1967

(1) Variety*	(2) On Hand Beginning of Period	(3) Received During Period	(4) Total	(5) Grain Disposed of				(6) On Hand End of Period	(7) Proposed or Suitable Use*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Common Rye	3 Bu.	0	3 Bu.	0	3 Bu.	0	3 Bu.	0	—	—	—
Crested Wheat	7 Bu.	0	7 Bu.	0	0	0	0	7 Bu.	7 Bu.	0	0
Wild Millet	19 Bu.	0	19 Bu.	0	0	0	0	19 Bu.	19 Bu.	0	0
Henchen Barley	200 Bu.	250 Bu.	450 Bu.	0	0	150 Bu.	150 Bu.	300 Bu.	0	300 Bu.	0
Roundstem Bulrush	4 Bu.	0	4 Bu.	0	2 Bu.	0	2 Bu.	2 Bu.	2 Bu.	0	0
Milo	25 Bu.	0	25 Bu.	0	0	20 Bu.	20 Bu.	5 Bu.	0	5 Bu.	0

(8) Indicate shipping or collection points Elko, Nevada - 60 miles

(9) Grain is stored at Headquarters metal granary

(10) Remarks 250 Bu. Henchen Barley trucked by refuge from Kootenai.

*See instructions on back.

NR-8a

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

(1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR–9.

(3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.

(4) A total of columns 2 and 3.

(6) Column 4 less column 5.

(7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.

(8) Nearest railroad station for shipping and receiving.

(9) Where stored on refuge: "Headquarters granary," etc.

(10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

INT.-DUP. SEC., WASH., D.C. 59323

3-1761
Form NR-11

TIMBER REMOVAL

Refuge Ruby Lake Year 1967

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
NONE								

Total acreage cut over..... Total income.....

No. of units removed B. F..... Method of slash disposal.....

Cords.....

Ties.....

.....

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

Refuge: **Ruby Lake**

Proposal Number:

Reporting Year: **1967**

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6/15 - 20	Thistles, mustard and white top	Dike roadsides	300	2-4-D Amine	75 gals.	2 lbs. A.E./A	Water 100 Gal/A	Bean sprayer 26' boom

10. Summary of results (continue on reverse side, if necessary)

90% apparent kill on broadleaved plants.

INTERIOR--PORTLAND, OREGON